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Preface

Audience

This guide is for the networking or computer technician responsible for installing the Catalyst 2960 switch, hereafter known as *the switch*. We assume that you are familiar with the concepts and terminology of Ethernet and local area networking. If you are interested in more training and education in these areas, learning opportunities including training courses, self-study options, seminars, and career certifications programs are available on the Cisco Training & Events web page:

<http://www.cisco.com/web/learning/index.html>

Purpose

This guide describes the hardware features of the Catalyst 2960 switch. It describes the physical and performance characteristics of the switch, explains how to install it, and provides troubleshooting information.

This guide does not describe system messages that you might receive or how to configure your switch. For more information, see the switch software configuration guide, the switch command reference, and the switch system message guide on the Cisco.com Product Documentation home page. For information about the standard Cisco IOS Release 12.1 or 12.2 commands, see the Cisco IOS documentation set from the Cisco.com home page by choosing **Support > Documentation > Product and Support Documentation/Cisco IOS Software**.

Conventions

This document uses these conventions and symbols for notes, cautions, and warnings:



Note

Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

**Warning****IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

The safety warnings for this product are translated into several languages in the *Regulatory Compliance and Safety Information for the Catalyst 2960 Switch* guide. The EMC regulatory statements are also included in that guide.

Related Documentation

These documents provide complete information about the switch and are available from this Cisco.com site:

http://www.cisco.com/en/US/products/ps6406/tsd_products_support_series_home.html

- *Release Notes for the Catalyst 3750, 3560, 2970, and 2960 Switches*

**Note**

Before installing, configuring, or upgrading the switch, refer to the release notes on Cisco.com for the latest information.

- *Catalyst 2960 Switch Software Configuration Guide*
- *Catalyst 2960 Switch Command Reference*
- *Catalyst 3750, 3560, 3550, 2970, and 2960 Switch System Message Guide*
- Device manager online help (available on the switch)
- Cisco Network Assistant online help (available on the switch)
- *Catalyst 2960 Switches Getting Started Guide (8-Port Switches)*
- *Catalyst 2960 Switch Getting Started Guide*. This guide is for the 24- and 48-port switches and provides information in these languages: English, Chinese (Simplified), French, German, Italian, Japanese, and Spanish
- *Regulatory Compliance and Safety Information for the Catalyst 2960 Switch*

For information about related products, see these documents on Cisco.com:

- *Getting Started with Cisco Network Assistant*
- *Release Notes for Cisco Network Assistant*
- *Cisco Small Form-Factor Pluggable Modules Installation Notes*
- *Cisco CWDM GBIC and CWDM SFP Installation Note*

- *Cisco Redundant Power System 2300 Hardware Installation Guide*
- *Cisco RPS 675 Redundant Power System Hardware Installation Guide*

These compatibility matrix documents are available from this Cisco.com site:

http://www.cisco.com/en/US/products/hw/modules/ps5455/products_device_support_tables_list.html

- *Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix*
- *Cisco 100-Megabit Ethernet SFP Modules Compatibility Matrix*
- *Cisco CWDM SFP Transceiver Compatibility Matrix*
- *Cisco Small Form-Factor Pluggable Modules Compatibility Matrix*
- *Compatibility Matrix for 1000BASE-T Small Form-Factor Pluggable Modules*
- *Cisco Redundant Power System 2300 Compatibility Matrix*

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.



CHAPTER 1

Product Overview

The Catalyst 2960 switch—also referred to as *the switch*—is an Ethernet switch to which you can connect devices such as workstations, Cisco Wireless Access Points, Cisco IP Phones, and other network devices including servers, routers, and other switches. This chapter provides a functional overview of the Catalyst 2960 switch. These topics are included:

- [Features, page 1-1](#)
- [Front Panel Description, page 1-4](#)
- [Rear Panel Description, page 1-19](#)
- [Management Options, page 1-22](#)

Features

You can deploy the 24- and 48-port Catalyst 2960 switches as backbone switches, aggregating 10BASE-T, 100BASE-TX, and 1000BASE-T Ethernet traffic from other network devices. The Catalyst 2960 8-port compact switches provide the same Ethernet connectivity, but you can deploy these switches outside of the traditional wiring closet environment, such as in office workspaces and classrooms. See the switch software configuration guide for deployment examples.

[Table 1-1](#) describes the switch model features.

Table 1-1 Catalyst 2960 Switch Model Descriptions

Switch Model	Supported Software Image	Description
Catalyst 2960-8TC-S	LAN-Lite	8 10/100BASE-TX Ethernet ports and 1 dual-purpose port (1 10/100/1000BASE-T copper port and 1 small form-factor pluggable [SFP] module slot); (no fan or RPS port)
Catalyst 2960-24-S	LAN-Lite	24 10/100BASE-TX Ethernet ports (no RPS port or SFP module slot)
Catalyst 2960-Plus 24TC-S	LAN-Lite	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-24TC-S	LAN-Lite	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-Plus 48TC-S	LAN-Lite	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-48TC-S	LAN-Lite	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports (no RPS port)
Catalyst 2960-48TT-S	LAN Lite	48 10/100BASE-TX ports and 2 10/100/1000 ports (no RPS port or SFP module slot)

Table 1-1 Catalyst 2960 Switch Model Descriptions (continued)

Switch Model	Supported Software Image	Description
Catalyst 2960-Plus 48PST-S	LAN-Lite	48 10/100B SE-TX PoE ports, 2 10/100/1000 ports, and 2 SFP module slots
Catalyst 2960-48PST-S	LAN-Lite	48 10/100BASE-TX PoE ports, 2 10/100/1000 ports, and 2 SFP module slots
Catalyst 2960-Plus 24PC-S	LAN-Lite	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-24PC-S	LAN-Lite	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-Plus 24LC-S	LAN-Lite	24 10/100BASE-TX ports (8 of which are PoE) and 2 dual-purpose ports
Catalyst 2960-24LC-S	LAN-Lite	24 10/100BASE-TX ports (8 of which are PoE) and 2 dual-purpose ports
Catalyst 2960-8TC-L	LAN-Base	8 10/100BASE-TX Ethernet ports and 1 dual-purpose port (no fan or RPS port)
Catalyst 2960G-8TC-L	LAN-Base	7 10/100/100BASE-TX Ethernet ports and 1 dual-purpose port (no fan or RPS port)
Catalyst 2960PD-8TT-L	LAN-Base	8 10/100BASE-TX Ethernet ports and 1 10/100/1000 port that receives power (no fan, RPS port, or SFP module slot)
Catalyst 2960-24LT-L	LAN-Base	24 10/100BASE-TX ports, 8 of which are Power over Ethernet (PoE), and 2 10/100/1000 ports (no SFP module slot)
Catalyst 2960-Plus 24PC-L	LAN-Base	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-24PC-L	LAN-Base	24 10/100BASE-TX PoE ports and 2 dual-purpose ports
Catalyst 2960-Plus 24TC-L	LAN-Base	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960-24TC-L	LAN-Base	24 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960G-24TC-L	LAN-Base	20 10/100/1000BASE-T Ethernet ports and 4 dual-purpose ports
Catalyst 2960-24TT-L	LAN-Base	24 10/100BASE-TX Ethernet ports and 2 10/100/1000BASE-T copper uplink ports (no SFP module slot)
Catalyst 2960-Plus 48PST-L	LAN-Base	48 10/100BASE-TX PoE ports, 2 10/100/1000BASE-T copper ports, and 2 SFP module slots
Catalyst 2960-48PST-L	LAN-Base	48 10/100BASE-TX PoE ports, 2 10/100/1000BASE-T copper ports, and 2 SFP module slots
Catalyst 2960-Plus 48TC-L	LAN-Base	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960-48TC-L	LAN-Base	48 10/100BASE-TX Ethernet ports and 2 dual-purpose ports
Catalyst 2960G-48TC-L	LAN-Base	44 10/100/1000BASE-T Ethernet ports and 4 dual-purpose ports
Catalyst 2960-48TT-L	LAN-Base	48 10/100BASE-TX Ethernet ports and 2 10/100/1000BASE-T copper uplink ports (no SFP module slot)
Catalyst 2960-Plus 24LC-L	LAN-Base	24 10/100BASE-TX ports (8 of which are PoE) and 2 dual-purpose ports

The Catalyst 2960-8TC-S, 2960-8TC-L, 2960G-8TC-L, and 2960PD-8TT-L switches are smaller than the other Catalyst 2960 switches. They can be mounted with a magnet, have security lock slots, and do not have a fan. See [“Catalyst 2960 8-Port Switches” section on page 1-9](#) for more information. See [Chapter 3, “Switch Installation \(8-Port Switches\),”](#) for the installation instructions for these switch models.

These PoE switches comply with Cisco prestandard PoE and IEEE 802.3af:

- Catalyst 2960-24LC-S
- Catalyst 2960-Plus 24LC-S
- Catalyst 2960-Plus 24LC-L
- Catalyst 2960-24LT-L
- Catalyst 2960-24PC-L
- Catalyst 2960-Plus 24PC-L
- Catalyst 2960-24PC-S
- Catalyst 2960-Plus 24PC-S
- Catalyst 2960-48PST-L
- Catalyst 2960-Plus 48PST-L
- Catalyst 2960-48PST-S
- Catalyst 2960-Plus 48PST-S

These are the SFP modules supported by the switches:

- 1000BASE-CWDM
- 1000BASE-BX
- 1000BASE-LX/LH
- 1000BASE-SX
- 1000BASE-T
- 1000BASE-ZX
- 100BASE-BX
- 100BASE-FX
- 100BASE-LX

The Catalyst 2960-24PC-L, 2960-Plus 24PC-L, 2960-24PC-S, 2960-Plus 24PC-S, 2960-24LC-S, 2960-Plus 24LC-S, 2960-Plus 24LC-L, 2960-24TC-L, 2960-Plus 24TC-L, 2960-48TC-L, 2960-Plus 48TC-L, 2960-48PST-L, 2960-Plus 48PST-L, 2960-48PST-S, 2960-Plus 48PST-S, 2960G-24TC-L, and 2960G-48TC-L switches support all the SFP modules.

The Catalyst 2960-8TC-S, 2960-24TC-S, 2960-Plus 24TC-S, 2960-48TC-S, and 2960-Plus 48TC-S switches support only 1000BASE-LX/LH, 1000BASE-SX, and 100BASE-FX SFP modules.

The Catalyst 2960-8TC-L, 2960G-8TC-L, and 2960-8TC-S switches do not support the 1000BASE-T or GLC-GE-100FX SFP modules.

For specific information about which SFP modules are supported on specific switches, see the *Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix* at this Cisco.com URL:

http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/compatibility/matrix/OL_6981.html

The 1000BASE-T SFP modules operate at 10, 100, or 1000 Mb/s in full-duplex mode or at 10 or 100 Mb/s in half-duplex mode when installed in Catalyst 2960 switches. The 10/100 and 10/100/1000 ports autonegotiate speed and support full-duplex or half-duplex mode.

Some Catalyst 2960 switches have a redundant power system (RPS) connector for an optional Cisco RPS 2300 or Cisco RPS 675 redundant power system that operates on AC input and supplies backup DC power to the switch. See the compatibility matrix documents for the RPS systems on Cisco.com for more information about switch support for the RPS models.

These switches do not have an RPS connector:

- Catalyst 2960-8TC-L
- Catalyst 2960G-8TC-L
- Catalyst 2960-8TC-S
- Catalyst 2960PD-8TT-L
- Catalyst 2960-24-S
- Catalyst 2960-24TC-S
- Catalyst 2960-Plus 24TC-S
- Catalyst 2960-48TT-S
- Catalyst 2960-48TC-S
- Catalyst 2960-Plus 48TC-S

Front Panel Description

These sections describe the switch front panels:

- [Catalyst 2960 Switch 24- and 48-Port Switches, page 1-4](#)
- [Catalyst 2960 8-Port Switches, page 1-9](#)
- [10/100 Ports, page 1-11](#)
- [10/100/1000 Ports, page 1-11](#)
- [PoE Ports \(Only Catalyst 2960 PoE Switches\), page 1-12](#)
- [SFP Module Slots, page 1-13](#)
- [Dual-Purpose Port, page 1-13](#)
- [Power Input Port \(Catalyst 2960PD-8TT-L Switch\), page 1-14](#)
- [LEDs, page 1-14](#)
- [Cable Guard for the Catalyst 2960 8-Port Switches, page 1-19](#)

Catalyst 2960 Switch 24- and 48-Port Switches

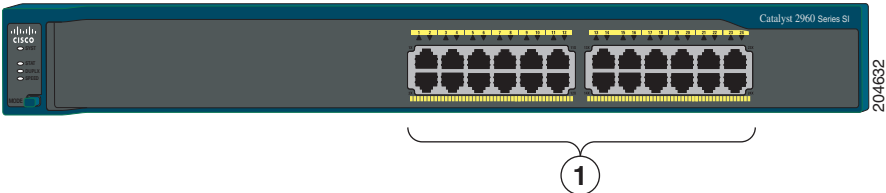
These sections describe the Catalyst 2960 24- and 48-port switches:

- [Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, and 2960-48TT-S Switches, page 1-5](#)
- [Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-L, 2960-Plus 24LC-S, 2960-24LC-S, 2960-Plus 24TC-L, 2960-24TC-L, 2960-Plus 48TC-L, 2960-48TC-L, 2960-24LT-L, 2960-24TT-L, 2960-48TT-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, and 2960-48PST-S Switches, page 1-6](#)
- [Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L Switches, page 1-9](#)

Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, and 2960-48TT-S Switches

The 10/100 ports on the Catalyst 2960-24-S switch are numbered as follows: The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on. See [Figure 1-1](#).

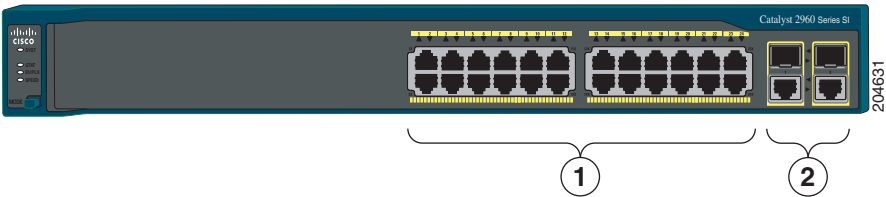
Figure 1-1 Catalyst 2960-24-S Switch Front Panel



1	10/100 ports
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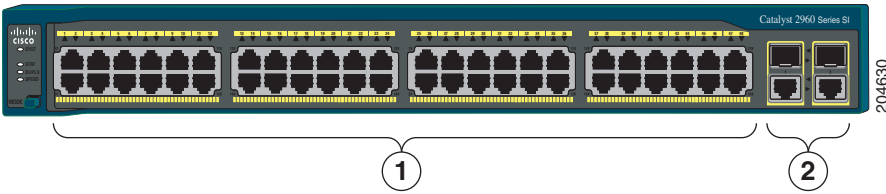
The 10/100 ports on the Catalyst 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, and 2960-48TC-S switches are numbered in the same way as the Catalyst 2960-24-S switch. These switches have dual-purpose ports, that is, 10/100/1000 ports 1 and 2 can use either the SFP module or the RJ-45 connector for that port, but not both at the same time. Use the software to set the connector type for these ports. For more information about the dual-purpose port, see the [“Dual-Purpose Port”](#) section on [page 1-13](#). See [Figure 1-2](#) and [Figure 1-3](#).

Figure 1-2 Catalyst 2960-Plus 24TC-S and 2960-24TC-S Switch Front Panel



1	10/100 ports	2	Dual-purpose ports
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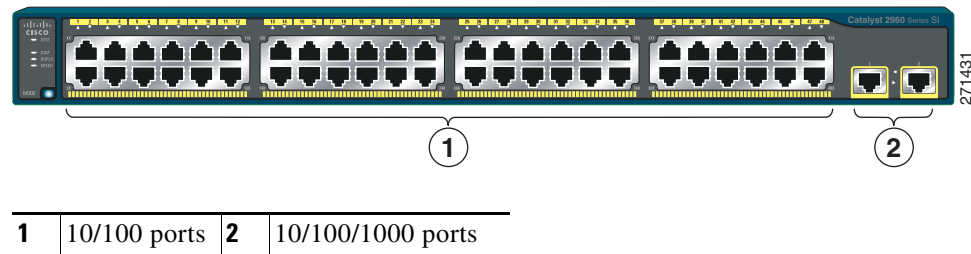
Figure 1-3 Catalyst 2960-Plus 48TC-S and 2960-48TC-S Switch Front Panel



1	10/100 ports	2	Dual-purpose ports
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The 10/100 ports on the Catalyst 2960-48TT-S switch are numbered as follows: The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on. This switch has two 10/100/1000 uplink ports, numbered 1 and 2. See [Figure 1-4](#).

Figure 1-4 Catalyst 2960-48TT-S Switch Front Panel



Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-L, 2960-Plus 24LC-S, 2960-24LC-S, 2960-Plus 24TC-L, 2960-24TC-L, 2960-Plus 48TC-L, 2960-48TC-L, 2960-24LT-L, 2960-24TT-L, 2960-48TT-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, and 2960-48PST-S Switches

The 10/100 ports on the switches are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on.

The fixed 10/100 ports on the Catalyst 2960-24PC-L and 2960-24PC-S switches are PoE ports. See [Figure 1-5](#) and [Figure 1-6](#).

Ports 1 to 8 on the Catalyst 2960-24LC-S switch are PoE ports. See [Figure 1-7](#).

Figure 1-5 Catalyst 2960-Plus 24PC-L and 2960-24PC-L Switch Front Panel

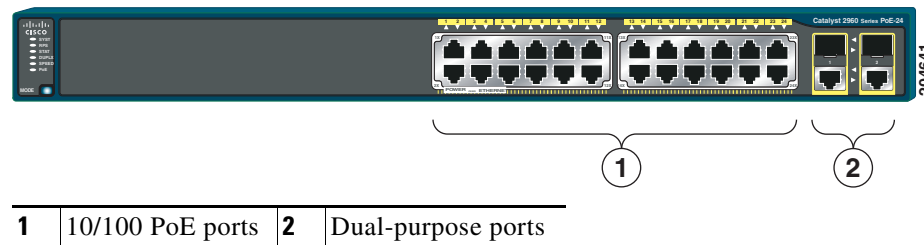


Figure 1-6 Catalyst 2960-Plus 24PC-S and 2960-24PC-S Switch Front Panel

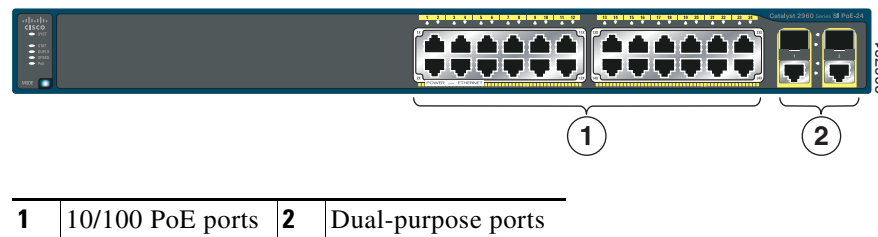
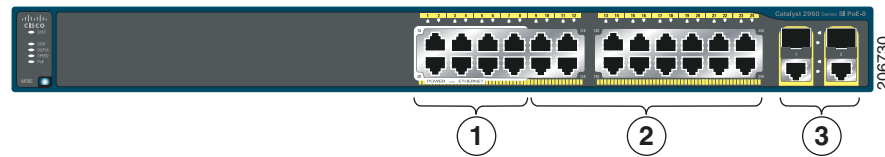


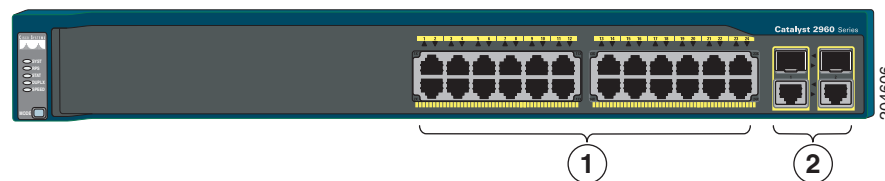
Figure 1-7 Catalyst 2960-Plus 24LC-L and 2960-24LC-S Switch Front Panel



1	10/100 PoE ports	3	Dual-purpose ports
2	10/100 ports		

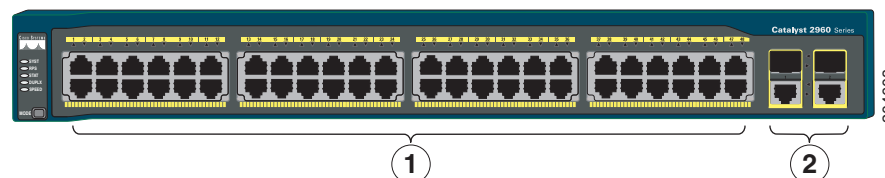
The Catalyst 2960-24TC-L and Catalyst 2960-48TC-L switches have dual-purpose ports, that is, 10/100/1000 ports 1 and 2 can use either the SFP module or the RJ-45 connector for that port, but not both. Use the software to set the connector type for these ports. For more information about the dual-purpose port, see the “Dual-Purpose Port” section on page 1-13. See Figure 1-8 and Figure 1-9.

Figure 1-8 Catalyst 2960-Plus 24TC-L and 2960-24TC-L Switch Front Panel



1	10/100 ports	2	Dual-purpose ports
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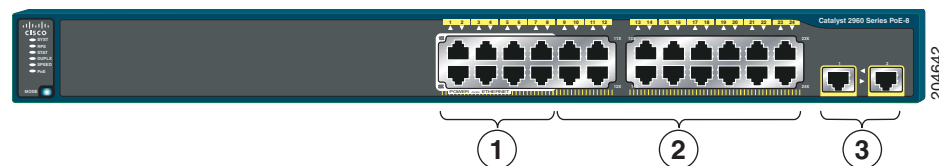
Figure 1-9 Catalyst 2960-Plus 48TC-L and 2960-48TC-L Switch Front Panel



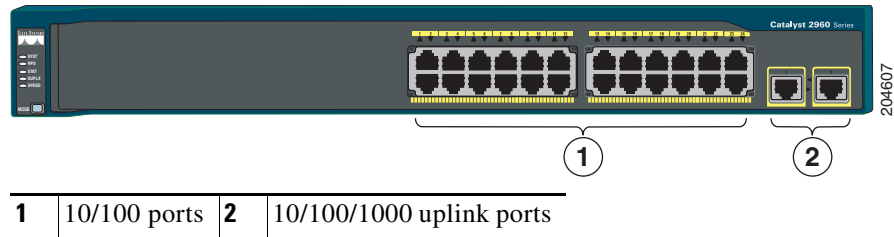
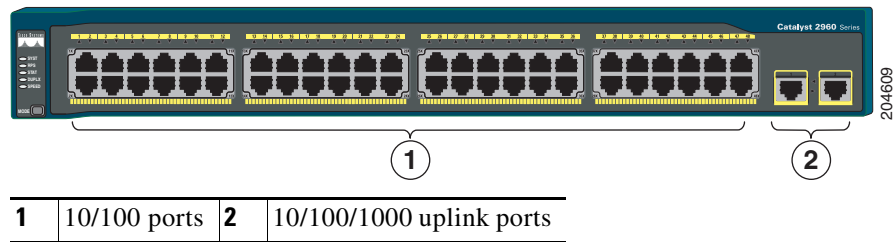
1	10/100 ports	2	Dual-purpose ports
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The Catalyst 2960-24LT-L, Catalyst 2960-24TT-L, and Catalyst 2960-48TT-L switches have two 10/100/1000 uplink ports, numbered 1 and 2. Ports 1 to 8 on the Catalyst 2960-24LT-L switch are PoE ports. See Figure 1-10, Figure 1-11, and Figure 1-12.

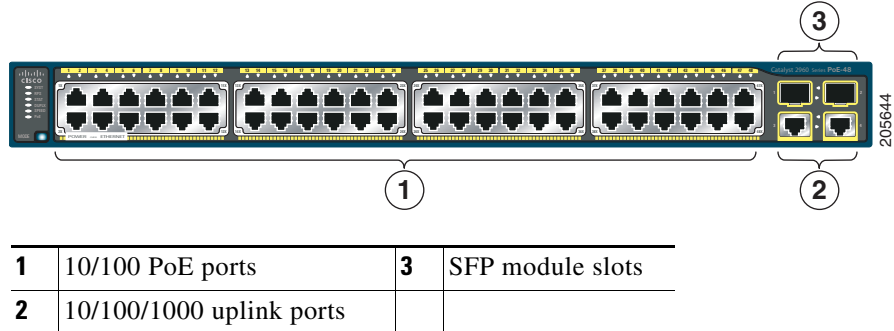
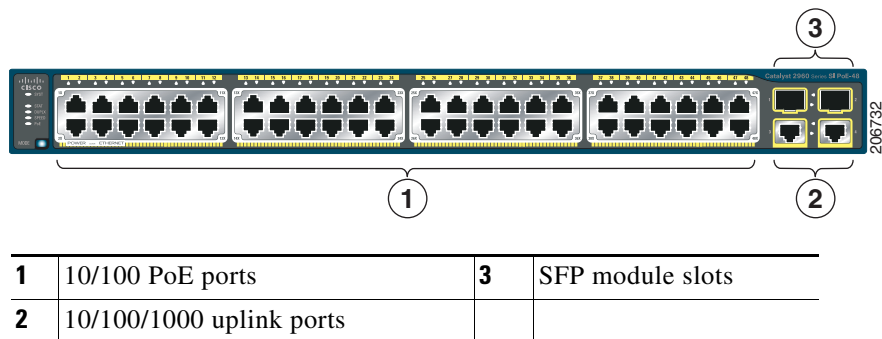
Figure 1-10 Catalyst 2960-24LT-L Switch Front Panel



1	10/100 PoE ports	3	10/100/1000 uplink ports
2	10/100 ports		

Figure 1-11 Catalyst 2960-24TT-L Switch Front Panel**Figure 1-12 Catalyst 2960-48TT-L Switch Front Panel**

The Catalyst 2960-48PST-L and 2960-48PST-S switches have two SFP module slots (numbered 1 and 2) and two 10/100/1000 uplink ports (numbered 3 and 4). Ports 1 to 48 on the switch are PoE ports. See [Figure 1-13](#) and [Figure 1-14](#).

Figure 1-13 Catalyst 2960-Plus 48PST-L and 2960-48PST-L Switch Front Panel**Figure 1-14 Catalyst 2960-Plus 48PST-S and 2960-48PST-S Switch Front Panel**

Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L Switches

The 10/100/1000 ports on the Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L switches are grouped in pairs. The first member of the pair (port 1) is above the second member (port 2), port 3 is above port 4, and so on. The SFP module slots are numbered 21 to 24 on the Catalyst 2960G-24TC-L switch and 45 to 48 on the Catalyst 2960G-48TC-L switch. See [Figure 1-15](#) and [Figure 1-16](#).

The Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L switches have dual-purpose ports, meaning ports 21 to 24 or 45 to 48 can use either the SFP module or the RJ-45 connector for that port, but not both. Use the software to set the connector type for these ports. For more information about the dual-purpose port, see the [“Dual-Purpose Port”](#) section on page 1-13.

Figure 1-15 Catalyst 2960G-24TC-L Switch Front Panel

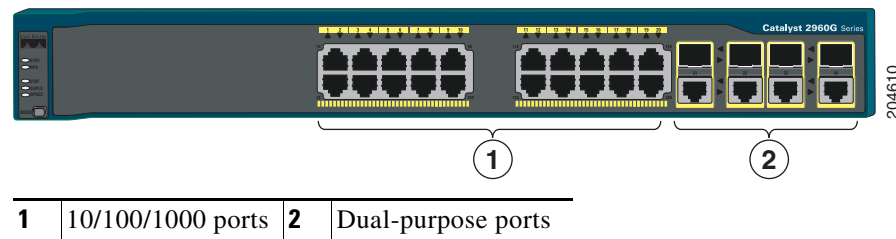
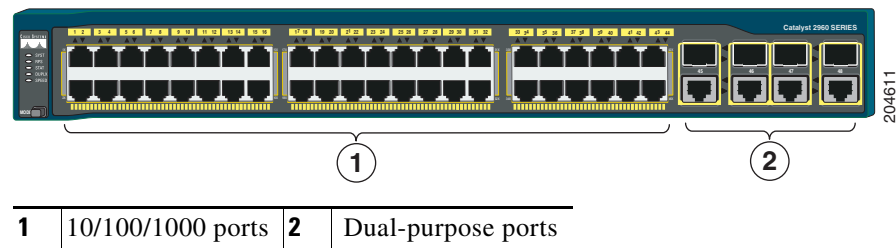


Figure 1-16 Catalyst 2960G-48TC-L Switch Front Panel



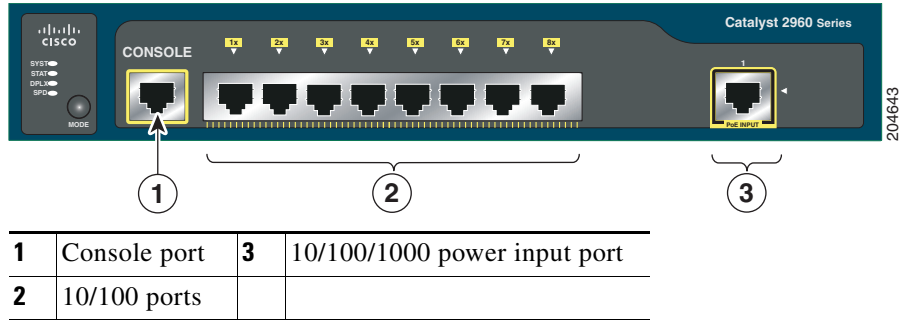
Catalyst 2960 8-Port Switches

These sections describe the Catalyst 2960 8-port switches:

- [Catalyst 2960PD-8TT-L Switch, page 1-9](#)
- [Catalyst 2960-8TC-S, Catalyst 2960-8TC-L, and Catalyst 2960G-8TC -L Switches, page 1-10](#)

Catalyst 2960PD-8TT-L Switch

The Catalyst 2960PD-8TT-L ([Figure 1-17](#)) switch front panel has a console port, eight 10/100 ports, and a 10/100/1000 uplink port that can receive power from an upstream PoE switch. The switch can also receive power from an optional AC power adapter that is connected through the rear panel.

Figure 1-17 Catalyst 2960PD-8TT-L Switch Front Panel

Catalyst 2960-8TC-S, Catalyst 2960-8TC-L, and Catalyst 2960G-8TC-L Switches

The console ports for the Catalyst 2960-8TC-S, Catalyst 2960-8TC-L, and Catalyst 2960G-8TC-L switches (Figure 1-18 to Figure 1-20) are on the front panels. The switches also have a dual-purpose port that can use either an RJ-45 connector or an SFP module, but not both at the same time. Use the software to set the connector type for these ports.

For more information on the dual-purpose port, see the “Dual-Purpose Port” section on page 1-13. For more information on the console port, see the “Console Port” section on page 1-21.

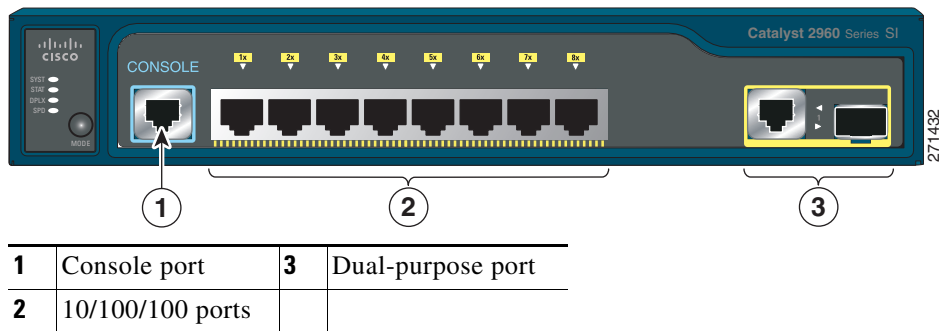
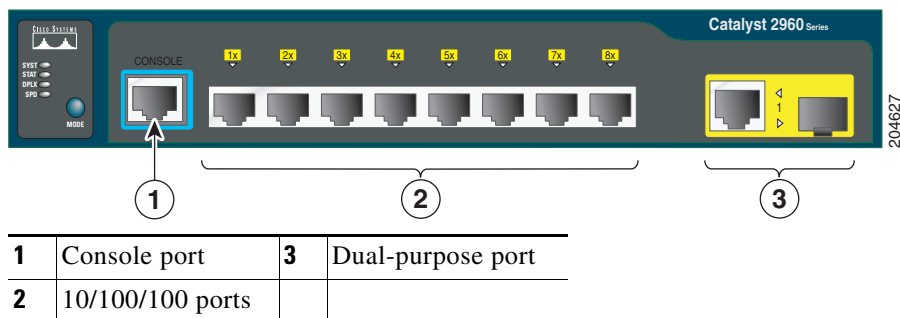
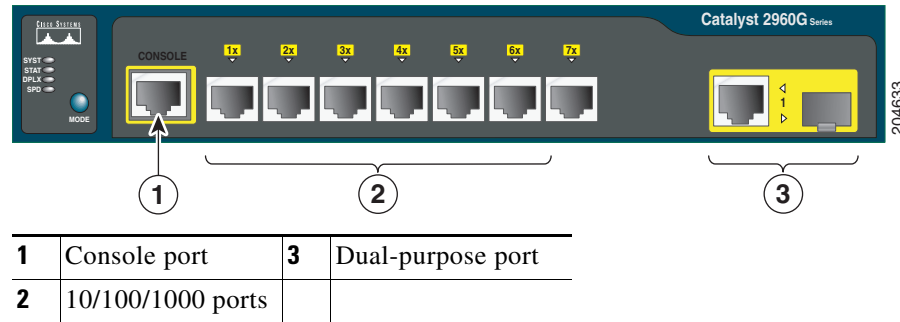
Figure 1-18 Catalyst 2960-8TC-S Switch Front Panel**Figure 1-19 Catalyst 2960-8TC-L Switch Front Panel**

Figure 1-20 Catalyst 2960G-8TC-L Switch Front Panel

10/100 Ports

You can set the 10/100 ports to operate at 10 or 100 Mb/s in full-duplex or half-duplex mode. You can also set these ports for speed and duplex autonegotiation. The default setting is autonegotiate. When the port is set to autonegotiate, it senses the speed and duplex settings of the attached device and advertises its own capabilities. If the connected device also supports autonegotiation, the switch port negotiates the best connection (that is, the fastest line speed that both devices support and full-duplex transmission if the attached device supports it) and configures itself accordingly. In all cases, the attached device must be within 328 feet (100 meters).

100BASE-TX traffic requires a Category 5 or higher cable. 10BASE-T traffic can use Category 3 or Category 4 cables.

When you connect the switch to workstations, servers, routers, and Cisco IP Phones, be sure that the cable is a straight-through cable. When you connect the switch to switches or hubs, use a crossover cable. Pinouts for the cables are described in [Appendix B, “Connector and Cable Specifications.”](#)

You can use the **mdix auto** interface configuration command in the command-line interface (CLI) to enable the auto-MDIX feature. When the auto-MDIX feature is enabled, the switch detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a copper 10/100/1000 or 1000BASE-T SFP module port on the switch, regardless of the type of device on the other end of the connection. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

10/100/1000 Ports

You can set the 10/100/1000 ports to operate at 10, 100, or 1000 Mb/s in full-duplex or half-duplex mode. You can also set these ports for speed and duplex autonegotiation. (The default setting is autonegotiate.) When you set the port for autonegotiation, it senses the speed and duplex settings of the attached device and advertises its own capabilities. If the connected device also supports autonegotiation, the switch port negotiates the best connection (that is, the fastest line speed that both devices support and full-duplex transmission if the attached device supports it) and configures itself accordingly. In all cases, the attached device must be within 328 feet (100 meters).

100BASE-TX and 1000BASE-T traffic requires a Category 5 or higher cable. 10BASE-T traffic can use Category 3 or Category 4 cables.

When you connect the switch to workstations, servers, routers, and Cisco IP Phones, be sure that the cable is a straight-through cable. When you connect the switch to switches or hubs, use a crossover cable. When using a straight-through or crossover cable for 1000BASE-T connections, be sure to use a twisted

four-pair, Category 5 or higher cable for proper operation. Pinouts for the cables are described in [Appendix B, “Connector and Cable Specifications.”](#)

You can use the **mdix auto** interface configuration command in the CLI to enable the automatic medium-dependent interface crossover (auto-MDIX) feature. When the auto-MDIX feature is enabled, the switch detects the required cable type for copper Ethernet connections and configures the interfaces accordingly. Therefore, you can use either a crossover or a straight-through cable for connections to a copper 10/100/1000 or 1000BASE-T SFP module port on the switch, regardless of the type of device on the other end of the connection. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

PoE Ports (Only Catalyst 2960 PoE Switches)

This section applies only to the Catalyst 2960-24PC-L, 2960-24LT-L, 2960-24PC-S, 2960-24LC-S, 2960 48PST-L, and 2960-48PST-S switches.



Warning

Voltages that present a shock hazard may exist on Power over Ethernet (PoE) circuits if interconnections are made using uninsulated exposed metal contacts, conductors, or terminals. Avoid using such interconnection methods, unless the exposed metal parts are located within a restricted access location and users and service people who are authorized within the restricted access location are made aware of the hazard. A restricted access area can be accessed only through the use of a special tool, lock and key or other means of security. Statement 1072

- The 10/100 ports on the Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, and 2960-24PC-S switches and ports 1 to 8 of the 10/100 ports on the Catalyst 2960-24LT-L, 2960-Plus 24LC-L, 2960-Plus 24LC-S, and 2960-24LC-S switches provide PoE support for devices that are compliant with IEEE 802.3af. The Cisco prestandard PoE is also supported for Cisco IP Phones and Cisco Aironet Access Points.
- Each of the PoE ports on the Catalyst 2960 switches deliver up to 15.4 W of PoE.
The Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, and 2960-24PC-S switches deliver a maximum power output of approximately 370-W PoE power.
The Catalyst 2960-24LT-L, 2960-Plus 24LC-L, 2960-Plus 24LC-S, and 2960-24LC-S switches deliver a maximum power output of approximately 124-W PoE power.
- On a per-port basis, you can control whether or not a Catalyst 2960 PoE port automatically provides power when an IP phone or an access point is connected. The device manager, Network Assistant, and the CLI provide PoE settings for each 10/100 PoE port:
 - Auto: When you select the Auto setting, the port provides power only if a valid powered device, such as an IEEE 802.3af-compliant powered device, a Cisco prestandard IP phone, or a Cisco prestandard Cisco access point, is connected. The Auto setting is the default.
 - Never: When you select the Never setting, the port does not provide power even if a Cisco IP phone or an access point is connected.

- You also can connect a Cisco IP Phone or Cisco Aironet Access Point to a Catalyst 2960 PoE switch 10/100 port and to an AC power source for redundant power. The powered device might switch to the AC power source as its primary power source upon being connected to it. In that case, the PoE port becomes the backup power source for the powered device.

If the primary source fails, the second power source becomes the primary power source to the powered device. During the power transfer, an IP phone might reboot or reestablish link with the switch.

For information about configuring and monitoring PoE ports, see the switch software configuration guide. For information about Cisco IP Phones and Cisco Aironet Access Points, see the documentation that came with your IP phone or access point.

Many legacy powered devices, including older Cisco IP phones and access points that do not fully support IEEE 802.3af, might not support PoE when connected to the switches by a crossover cable.

SFP Module Slots

The Catalyst 2960 switches (other than those listed) use Gigabit Ethernet SFP modules for Gigabit uplink connections and 100-Megabit SFP modules for 100-Megabit connections to establish fiber-optic connections. These Catalyst 2960 switches do not have an SFP module slot:

- Catalyst 2960PD-8TT-L
- Catalyst 2960-24LT-L
- Catalyst 2960-24-S
- Catalyst 2960-24TT-L
- Catalyst 2960-48TT-L
- Catalyst 2960-48TT-S

The transceiver modules are field-replaceable, providing the uplink interfaces when you insert an SFP module. You can use the SFP modules for Gigabit uplink connections to other switches. You use fiber-optic cables with LC connectors to connect to a fiber-optic SFP module. You use Category 5 or higher cable with RJ-45 connectors to connect to a copper SFP module.

For more information about these SFP modules, see your SFP module documentation or the release notes for your switch software. For more information about cabling requirements, see [Appendix B, “Connector and Cable Specifications.”](#)

Dual-Purpose Port

You can configure a dual-purpose port as either a 10/100/1000 port or as an SFP module port. Each port is considered as a single interface with dual front ends—an RJ-45 connector and an SFP module connector. The dual front ends are not redundant interfaces. The switch activates only one connector of the pair at a time.

By default, the switch dynamically selects the interface type that first links up. However, you can use the **media-type interface configuration** command to manually select the RJ-45 connector or the SFP module connector. For information about configuring speed and duplex settings for a dual-purpose uplink, see the software configuration guide.

Each uplink port has two LEDs: one shows the status of the RJ-45 port, and one shows the status of the SFP module port. The port LED is on the active connector.

Power Input Port (Catalyst 2960PD-8TT-L Switch)

The Catalyst 2960PD-8TT-L can receive power from these sources:

1. Through a 10/100/1000 port from an upstream Ethernet switch that provides power (complies with IEEE 802.3af). (See [Figure 1-21](#).)
2. Through an external AC power adapter that connects to the back of the switch. This external power adapter (PWR-A=) is not included with the switch, but you can order it from your Cisco representative. (See [Figure 1-22](#).)

Figure 1-21 Connecting Through a 10/100/1000 Port

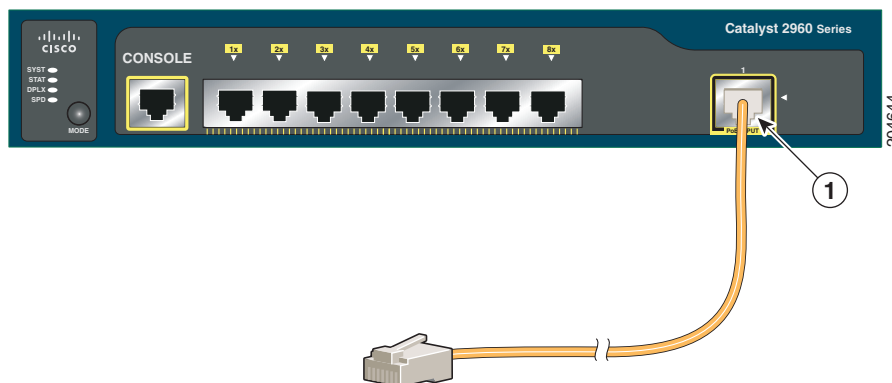
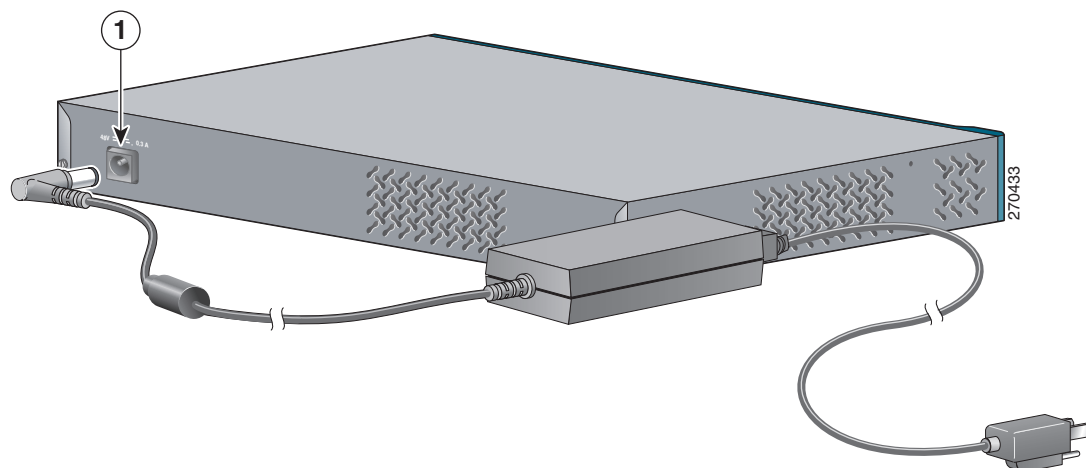


Figure 1-22 Connecting Through an External AC Power Adapter



1	Power adapter port
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LEDs

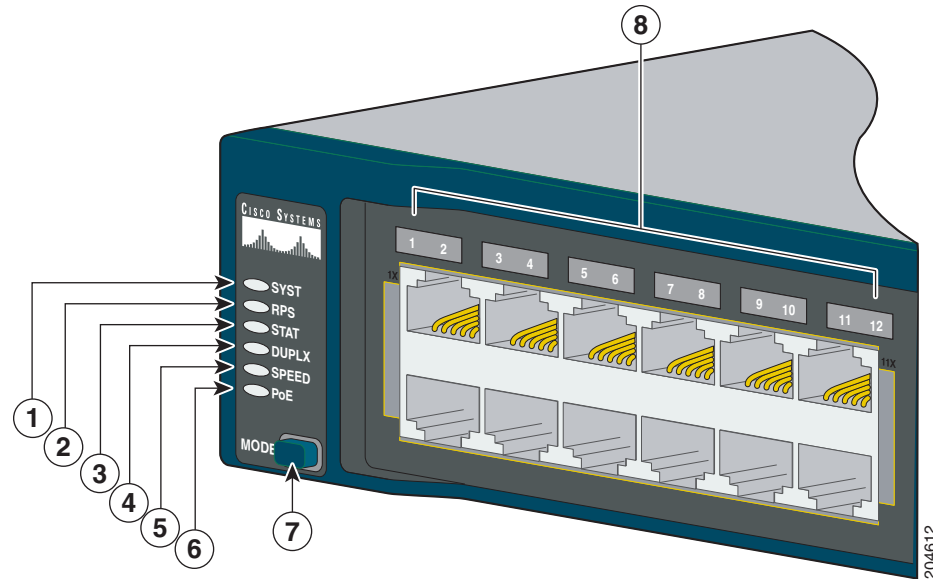
You can use the switch LEDs to monitor switch activity and its performance. [Figure 1-23](#) shows the switch LEDs and the Mode button that you use to select one of the port modes.

All LEDs are visible through the GUI management applications—Network Assistant for multiple switches and the device manager for a single switch. The switch software configuration guide describes how to use the CLI to configure and to monitor individual switches and switch clusters.

Only the Catalyst 2960 PoE switches have a PoE LED.

The four Catalyst 2960 8-port switches and these models do not have an RPS connector or an RPS LED: Catalyst 2960-24-S, Catalyst 2960-Plus 24TC-S, 2960-24TC-S, 2960-48TT-S, 2960-Plus 48TC-S, 2960-48TC-S.

Figure 1-23 Catalyst 2960 Switch LEDs



1	SYST LED	5	Speed LED
2	RPS LED	6	PoE LED ¹
3	Status LED	7	Mode button
4	Duplex LED	8	Port LEDs

1. The PoE LED is only on the Catalyst 2960 PoE switches.

System LED

The System LED shows whether the system is receiving power and is functioning properly. [Table 1-2](#) lists the LED colors and their meanings.

Table 1-2 System LED

Color	System Status
Off	System is not powered on.
Green	System is operating normally.
Amber	System is receiving power but is not functioning properly.

RPS LED

The RPS LED shows the RPS status. [Table 1-3](#) lists the LED colors and their meanings.


Note

The Catalyst 2960 8-port switches, and the Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, and 2960-48TT-S switches do not have an RPS LED.

Table 1-3 RPS LED

Color	RPS Status
Off	RPS is off or not properly connected.
Green	RPS is connected and ready to provide back-up power, if required.
Blinking green	RPS is connected but is unavailable because it is providing power to another device (redundancy has been allocated to a neighboring device).
Amber	The RPS is in standby mode or in a fault condition. Press the Standby/Active button on the RPS, and the LED should turn green. If it does not, the RPS fan could have failed. Contact Cisco Systems.
Blinking amber	The internal power supply in a switch has failed, and the RPS is providing power to the switch (redundancy has been allocated to this device).

For more information about the Cisco RPS 2300 or the Cisco RPS 675, see the related hardware installation guide for that power system.

Port LEDs and Modes

The port LEDs, as a group or individually, display information about the switch and about the individual ports ([Table 1-4](#)):

Table 1-4 Modes for Port LEDs

Selected Mode LED	Port Mode	Description
STAT	Port status	The port status. This is the default mode.
DUPLX	Port duplex mode	The port duplex mode: full duplex or half duplex.
SPEED ¹	Port speed	The port operating speed: 10, 100, or 1000 Mb/s.
PoE ²	PoE port power	The PoE status.

1. When installed in Catalyst 2960 switches, 1000BASE-T SFP modules can operate at 10, 100, or 1000 Mb/s in full-duplex mode or at 10 or 100 Mb/s in half-duplex mode.
2. The PoE LED is only on the Catalyst 2960 PoE switches.

Even if the PoE mode is not selected, the PoE LED shows PoE problems when they are detected (Table 1-5). The PoE LED applies only to Catalyst 2960 switches that support PoE.

Table 1-5 PoE Mode LED


Color	PoE Status
Off	PoE mode is not selected. None of the 10/100 PoE ports have been denied power or are in a fault condition.
Green	PoE mode is selected, and the PoE status is shown on the port LEDs.
Blinking amber	PoE mode is not selected. At least one of the 10/100 PoE ports has been denied power, or at least one of the ports has a PoE fault.

To select or change a mode, press the Mode button until the desired mode is highlighted. When you change port modes, the meanings of the port LED colors also change. Table 1-6 explains how to interpret the port LED colors in different port modes.

Table 1-6 Meaning of Port LED Colors in Different Modes on the Switch

Port Mode	LED Color	Meaning
STAT (port status)	Off	No link, or port was administratively shut down.
	Green	Link present.
	Blinking green	Activity. Port is sending or receiving data.
	Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, cyclic redundancy check (CRC) errors, and alignment and jabber errors are monitored for a link-fault indication.
	Amber	Port is blocked by Spanning Tree Protocol (STP) and is not forwarding data. Note After a port is reconfigured, the port LED can remain amber for up to 30 seconds as STP checks the network topology for possible loops.
	Blinking amber	Port is blocked by STP and is not sending or receiving packets.
DUPLX (duplex)	Off	Port is operating in half duplex.
	Green	Port is operating in full duplex.
SPEED	10/100 and 10/100/1000 ports	
	Off	Port is operating at 10 Mb/s.
	Green	Port is operating at 100 Mb/s.
	Blinking green	Port is operating at 1000 Mb/s.
	SFP ports	
	Off	Port is operating at 10 Mb/s.
	Green	Port is operating at 100 Mb/s.
	Blinking green	Port is operating at 1000 Mb/s.
		Note When installed in Catalyst 2960 switches, 1000BASE-T SFP modules can operate at 10, 100, or 1000 Mb/s in full-duplex mode or at 10 or 100 Mb/s in half-duplex mode.

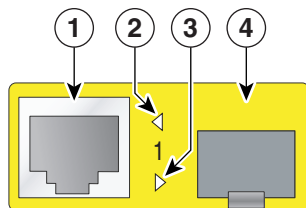
Table 1-6 *Meaning of Port LED Colors in Different Modes on the Switch (continued)*

Port Mode	LED Color	Meaning
PoE	Off	PoE is off. If the powered device is receiving power from an AC power source, the PoE port LED is off even if the powered device is connected to the switch port.
	Green	PoE is on. The port LED is green only when the switch port is providing power.
	Alternating green and amber	PoE is denied because providing power to the powered device will exceed the switch power capacity. The Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, and 2960-24PC-S switches provide up to 370 W of power. The Catalyst 2960-24LT-L, 2960-Plus 24LC-L, 2960-Plus 24LC-S, and 2960-24LC-S switches provide up to 124 W of power.
	Blinking amber	PoE is off due to a fault.  Caution PoE faults are caused when noncompliant cabling or powered devices are connected to a PoE port. Only standard-compliant cabling can be used to connect Cisco prestandard IP Phones or wireless access points or IEEE 802.3af-compliant devices to PoE ports. You must remove from the network the cable or device that causes a PoE fault.
	Amber	PoE for the port has been disabled. By default, PoE is enabled.

Dual-Purpose Port LEDs

The LEDs on a dual-purpose port show whether an RJ-45 connector is connected to the port, or if an SFP module is installed in the slot. See the example in [Figure 1-24](#). You can configure each port as either a 10/100/1000 port through the RJ-45 connector or as an SFP module, but not both at the same time. The LEDs show how the port is being used (Ethernet or SFP module).

The LED colors have the same meanings as described in [Table 1-4](#) and [Table 1-6](#).

Figure 1-24 *Dual-Purpose Port LEDs*

1	RJ-45 connector	3	SFP module port in-use LED
2	RJ-45 port in-use LED	4	SFP module slot

Cable Guard for the Catalyst 2960 8-Port Switches

You can order an optional cable guard to secure cables to the front of the Catalyst 2960-8TC-L, 2960G-8TC-L, 2960-8TC-S, and 2960PD-8TT-L switches and prevent them from being accidentally removed.

To order a cable guard, contact your Cisco representative using these part numbers:

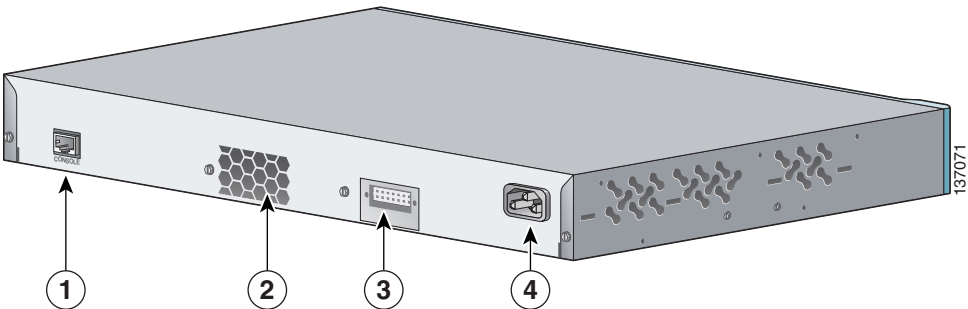
- CBLGRD-C2960-8TC: Catalyst 2960-8TC-L, 2960-8TC-S, and 2960PD-8TT-L switches
- CBLGRD-C2960G-8TC: Cisco Catalyst 2960G-8TC switch

Rear Panel Description

- [Internal Power Supply, page 1-20](#)
- [Cisco RPS, page 1-20](#)
- [Console Port, page 1-21](#)

Depending on the Catalyst 2960 switch model, the switch can have an RJ-45 console port, a fan exhaust, an RPS connector, and an AC power connector (see [Figure 1-25](#) for an example of a Catalyst 2960 rear panel).

Figure 1-25 Catalyst 2960 Switch Rear Panel



1	RJ-45 console port ¹	3	RPS connector ²
2	Fan exhaust ³	4	AC power connector ⁴

1. The Catalyst 2960 8-port switches have the console port on the front panel rather than on the rear panel.
2. These Catalyst 2960 switches do not have an RPS connector: Catalyst 8-port switches, 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, and 2960-48TT-S switches.
3. The Catalyst 2960 8-port switches do not have a fan.
4. The Catalyst 2960PD-8TT-L switch does not have an AC internal power supply.

Internal Power Supply

All switches other than the Catalyst 2960PD-8TT-L are powered through their internal power supply. The internal power supply is an autoranging unit that supports input voltages between 100 and 240 VAC. Use the supplied AC power cord to connect the AC power connector to an AC power outlet.



Note

The Catalyst 2960PD-8TT-L switch does not have an internal power supply. For more information, see [“Power Input Port \(Catalyst 2960PD-8TT-L Switch\)” section on page 1-14](#).

Cisco RPS

Depending on the switch model, you can connect the switch to either of these Cisco redundant power systems (RPS) to provide backup power if the switch power supply fails:

- [“Cisco RPS 2300” section on page 1-20](#)
- [“Cisco RPS 675” section on page 1-21](#)

Connect the switch and the Cisco RPS to the same AC power source. Use the RPS connector cable supplied with the RPS to connect the RPS to the switch.



Warning

Attach only the following Cisco RPS model to the RPS receptacle: PWR-RPS2300 / PWR675-AC-RPS-N1 Statement 370



Note

These Catalyst 2960 switches do not have an RPS connector: Catalyst 8-port switches, 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, 2960-48TC-S, 2960-48TT-S, 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-S, and 2960-24LC-S switches.



Note

These Catalyst 2960 switches support only the Cisco RPS 2300: Catalyst 2960-24PC-L, 2960-24LT-L, and 2960-48PST-L switches.

For complete information about the Cisco RPS products, including compatibility matrixes listing the supported RPS for each Catalyst 2960 switch, see the RPS documents on Cisco.com:

http://www.cisco.com/en/US/products/ps7148/prod_installation_guides_list.html

Cisco RPS 2300

The Cisco RPS 2300 is a redundant power system that supports six network switches and provides power to one or two failed switches at a time. It automatically senses when the internal power supply of a connected switch fails and provides power to the failed switch, preventing loss of network traffic.

The Cisco RPS 2300 has two output levels: -52 V and 12 V. The total maximum output power depends on the installed power-supply modules.

All supported, connected switches can simultaneously communicate with the RPS 2300. You can configure these RPS 2300 features through the switch software:

- Enable RPS active or standby mode for each connected switch

- Configure switch priority for RPS support
- List the connected switches and the power-supply module sizes
- Obtain reports when a switch is powered by the RPS
- Obtain status reports for the RPS power-supply module
- Read and monitor backup, failure, and exception history

Cisco RPS 675

The Cisco 675 RPS is a redundant power system that supports six network devices and provides power to one failed switch at a time. It automatically senses when the internal power supply of a connected switch fails and provides power to the failed switch, preventing loss of network traffic.

The Cisco RPS 675 has two output levels: –48 V and 12 V. The total maximum output power is 675 W.

Console Port

You can connect the switch to a PC by means of the console port and the supplied RJ-45-to-DB-9 female cable. If you want to connect the switch console port to a terminal, you need to provide an RJ-45-to-DB-25 female DTE adapter. You can order a kit (part number ACS-DSBUASYN=) containing that adapter from Cisco. For console port and adapter pinout information, see the [“Connector and Cable Specifications”](#) section on page B-1.



Note

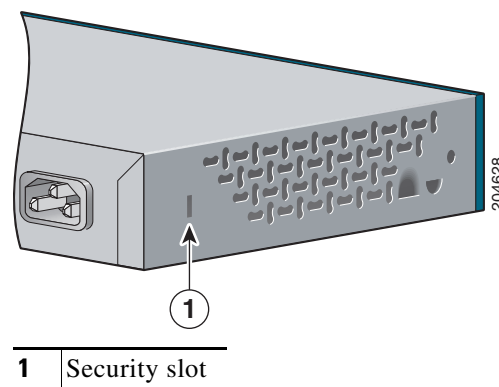
The console port on the Catalyst 2960 8-port switches is on the front panel rather than on the rear panel.

Security Slots

The Catalyst 2960 8-port switches have security slots on the left and right side panels. You can install an optional cable lock, such as the type that is used to secure a laptop computer, to secure either or both sides of the switch.

[Figure 1-26](#) shows the slot on a left-side panel.

Figure 1-26 **Switch Left Panel**



Management Options

The Catalyst 2960 switches offer several management options:

- Cisco Network Assistant

Network Assistant is a PC-based network management GUI with centralized management of Cisco LAN switches, core switches, routers, access points, IP phones, and PIX firewalls.

Network Assistant is available at no cost and can be downloaded from this URL:

<http://www.cisco.com/go/cna>

For information on starting Network Assistant, see the *Getting Started with Cisco Network Assistant* guide on Cisco.com.

- Device manager

You can use the device manager, which is in the switch memory, to manage individual and standalone switches. Device manager is a web interface that offers quick configuration and monitoring. You can access the device manager from anywhere in your network through a web browser. For more information, see the device manager online help.

- Cisco IOS command-line interface (CLI)

The switch CLI is based on Cisco IOS software and is enhanced to support desktop-switching features. You can fully configure and monitor the switch and switch cluster members from the CLI. You can access the CLI either by connecting your management station directly to the switch console port or by using Telnet from a remote management station. See the *Catalyst 2960 Switch Command Reference* on Cisco.com for more information.

For setup instructions that use the CLI, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

- CiscoView application

The CiscoView device-management application displays the switch image that you can use to set configuration parameters and to view switch status and performance information. The CiscoView application, which you purchase separately, can be a standalone application or part of a Simple Network Management Protocol (SNMP) platform. See the CiscoView documentation for more information.

- SNMP network management

You can use SNMP management applications such as CiscoWorks LAN Management Solution (LMS) and HP OpenView to configure and manage the switch. You also can manage it from an SNMP-compatible workstation that is running platforms such as HP OpenView or SunNet Manager.

The Cisco Configuration Engine is a network management device that works with embedded CNS agents in the switch software. You can use Cisco Configuration Engine to automate initial configurations and configuration updates on the switch.

Network Configurations

See the switch software configuration guide on Cisco.com for an explanation of network configuration concepts. The software configuration guide also provides examples of network configurations that use the switch to create dedicated network segments that are interconnected through Gigabit Ethernet connections.



CHAPTER 2

Switch Installation (24- and 48-Port Switches)

This chapter describes how to start your switch and how to interpret the power-on self-test (POST) that ensures proper operation. It also describes how to install the switch and how to make connections to the switch.

This chapter provides installation information for all Catalyst 2960 switches, except for the Catalyst 2960-8TC-S, 2960-8TC-L, 2960G-8T-LC, 2960-48PST-L, and 2960PD-8TT-L switches. For those switches, see [Chapter 3, “Switch Installation \(8-Port Switches\).”](#)

The instructions in this chapter for connecting to the switch ports and for installing and connecting to the small form-factor pluggable (SFP) modules apply to all Catalyst 2960 switches, including the 8-port switches.

Read the topics and perform the procedures in this order:

- [Preparing for Installation, page 2-1](#)
- [Verifying Switch Operation, page 2-5](#)
- [Installing the Switch, page 2-6](#)
- [Connecting to the 10/100 and 10/100/1000 Ports, page 2-14](#)
- [Installing and Removing SFP Modules, page 2-15](#)
- [Connecting to SFP Modules, page 2-18](#)
- [Connecting to a Dual-Purpose Port, page 2-20](#)
- [Where to Go Next, page 2-21](#)

Preparing for Installation

This section covers these topics:

- [Warnings, page 2-2](#)
- [Guidelines for Particulate Matter, page 2-4](#)
- [Installation Guidelines, page 2-4](#)
- [Box Contents, page 2-5](#)
- [Tools and Equipment, page 2-5](#)

Warnings

These warnings are translated into several languages in the *Regulatory Compliance and Safety Information for the Catalyst 2960 Switch* guide.



Warning

To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 113°F (45°C). To prevent airflow restriction, allow at least 3 inches (7.6 cm) of clearance around the ventilation openings. Statement 17B



Warning

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43



Warning

Do not stack the chassis on any other equipment. If the chassis falls, it can cause severe bodily injury and equipment damage. Statement 48



Warning

Ethernet cables must be shielded when used in a central office environment. Statement 171



Warning

If a redundant power system (RPS) is not connected to the switch, install an RPS connector cover on the back of the switch. Statement 265



Warning

**Attach only the following Cisco RPS model to the RPS receptacle:
PWR-RPS2300, PWR675-AC-RPS-N1=.** Statement 370



Warning

Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378



Warning

Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001



Warning

Read the installation instructions before connecting the system to the power source. Statement 1004

**Warning**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

**Warning**

Class 1 laser product. Statement 1008

**Warning**

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

**Warning**

The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019

**Warning**

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

**Warning**

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit. Statement 1028

**Warning**

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

**Warning**

Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040.

**Warning**

For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection: 10/100/1000 Ethernet. Statement 1044

**Warning**

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

**Warning**

Voltages that present a shock hazard may exist on Power over Ethernet (PoE) circuits if interconnections are made using uninsulated exposed metal contacts, conductors, or terminals. Avoid using such interconnection methods, unless the exposed metal parts are located within a restricted access location and users and service people who are authorized within the restricted access location are made aware of the hazard. A restricted access area can be accessed only through the use of a special tool, lock and key or other means of security. Statement 1072

**Warning**

No user-serviceable parts inside. Do not open. Statement 1073

**Warning**

Installation of the equipment must comply with local and national electrical codes. Statement 1074

Guidelines for Particulate Matter

Cisco Ethernet switches are equipped with cooling mechanisms, such as fans and blowers. However, these fans and blowers can draw dust and other particles, causing contaminant buildup inside the chassis, which can result in a system malfunction.

You must install this equipment in an environment as free as possible from dust and foreign conductive material (such as metal flakes from construction activities).

These standards provide guidelines for acceptable working environments and acceptable levels of suspended particulate matter:

- Network Equipment Building Systems (NEBS) GR-63-CORE
- National Electrical Manufacturers Association (NEMA) Type 1
- International Electrotechnical Commission (IEC) IP-20

This precaution applies to all Catalyst 2960 switches except for the Catalyst 2960-8TC-L, 2960-8TC-S, 2960G-8TC-L, and 2960PD-8TT-L switches.

Installation Guidelines

This section does not apply to the Catalyst 2960 8-port switches. For information applicable to those switches, see [Chapter 3, “Switch Installation \(8-Port Switches\).”](#)

When you determine where to place the switch, be sure to observe these requirements:

- For 10/100/1000 ports, cable lengths from the switch to connected devices must be no longer than 328 feet (100 meters).
- The cables meet the specifications in [Table B-1 on page B-5](#), which lists the cable specifications for 1000BASE-X and 100BASE-X SFP modules for the Catalyst 2960 switch. Catalyst 2960 switch SFP ports can use both GLC-GE-100XX and GLC-FE-100XX SFP modules.

When you use shorter lengths of single-mode fiber cable, you might need to insert an inline optical attenuator in the link to avoid overloading the receiver.

When the fiber-optic cable span is less than 15.43 miles (25 km), you should insert a 5-decibel (dB) or 10-dB inline optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASE-ZX SFP module at each end of the link.

- The operating environment must be within the ranges listed in [Appendix A, “Technical Specifications.”](#)
- Clearance to front and rear panels meets these conditions:
 - You can easily read the front-panel indicators.
 - Access to ports is sufficient for unrestricted cabling.
 - The rear-panel power connector is within reach of an AC power receptacle.
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures. Make sure the cabling is safely away from other devices that might damage the cables.
- Airflow around the switch and through the vents is unrestricted.
- Temperature around the unit does not exceed 113°F (45°C).

If the switch is installed in a closed or multirack assembly, the temperature around it might be greater than normal room temperature.

Box Contents

The switch getting started guide on Cisco.com describes the box contents. If any item is missing or damaged, contact your Cisco representative or reseller for support.

Tools and Equipment

You need to supply a number-2 Phillips screwdriver to rack-mount the switch.

Verifying Switch Operation

Before you install the switch in a rack, on a wall, or on a table or shelf, you should power on the switch and verify that the switch passes POST.

If your configuration has an RPS, connect the switch and the RPS to the same AC power source. See [Chapter 3, “Switch Installation \(8-Port Switches\),”](#) and see the Cisco RPS documentation for more information.



Note

When you connect the RPS to the switch, put the RPS in standby mode. Set the RPS to active mode during normal operation.

To power on the switch, connect one end of the AC power cord to the AC power connector on the switch, and connect the other end of the power cord to an AC power outlet.

**Warning**

Attach only the following Cisco RPS model to the RPS receptacle:
PWR-RPS2300, PWR675-AC-RPS-N1=. Statement 370

As the switch powers on, it begins the POST, a series of tests that runs automatically to ensure that the switch functions properly. LEDs can blink during the test. POST lasts approximately 1 minute. When the switch begins POST, the System, RPS, Status, Duplex, and Speed LEDs turn green. The System LED blinks green, and the other LEDs remain solid green.

When the POST completes successfully, the System LED remains green. The RPS LED remains green for some time and then reflects the switch operating status. The other LEDs turn off and then reflect the switch operating status. If a switch fails POST, the System LED turns amber.

POST failures are usually fatal. Call Cisco technical support representative if your switch fails POST.

After a successful POST, disconnect the power cord from the switch. Install the switch in a rack, on a wall, on a table, or on a shelf as described in the [“Installing the Switch” section on page 2-6](#).

Installing the Switch

This section applies to all switches except the Catalyst 8-port switches. For information applicable to those switches, see [Chapter 3, “Switch Installation \(8-Port Switches\).”](#)

This section describes these installation procedures:

- [Rack-Mounting, page 2-6](#)
- [Wall-Mounting, page 2-11](#)
- [Table- or Shelf-Mounting, page 2-14](#)

Rack-Mounting

This section applies to all switches except the Catalyst 8-port switches. For information applicable to those switches, see [Chapter 3, “Switch Installation \(8-Port Switches\).”](#) The illustrations in this section might not show your specific switch; however, the instructions apply to all 24- and 48-port switches.

**Warning**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

To install the switch in a 19-inch or 24-inch rack (24-inch racks require optional mounting hardware), follow the instructions described in these sections:

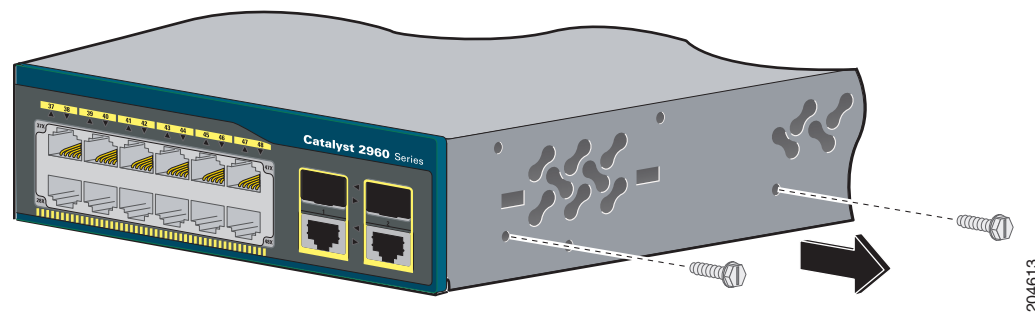
- [Removing Screws from the Switch, page 2-7](#)
- [Attaching Brackets to the Catalyst 2960 Switch, page 2-7](#)
- [Mounting the Switch in a Rack, page 2-10](#)
- [Attaching the Cable Guide, page 2-11](#)

An optional bracket kit that is not included with the switch is required to install the switch in a 24-inch rack. You can order a kit that contains the 24-inch rack-mounting brackets and hardware from Cisco by using part number RCKMNT-1RU=.

Removing Screws from the Switch

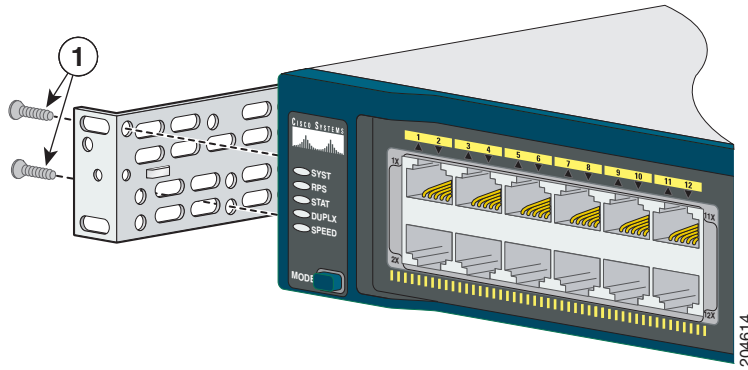
If you plan to install the switch in a rack, you must first remove screws in the switch chassis so that you can attach the mounting brackets. [Figure 2-1](#) shows how to remove the chassis screws in a Catalyst 2960 switch.

Figure 2-1 Removing Screws from the Catalyst 2960 Switch

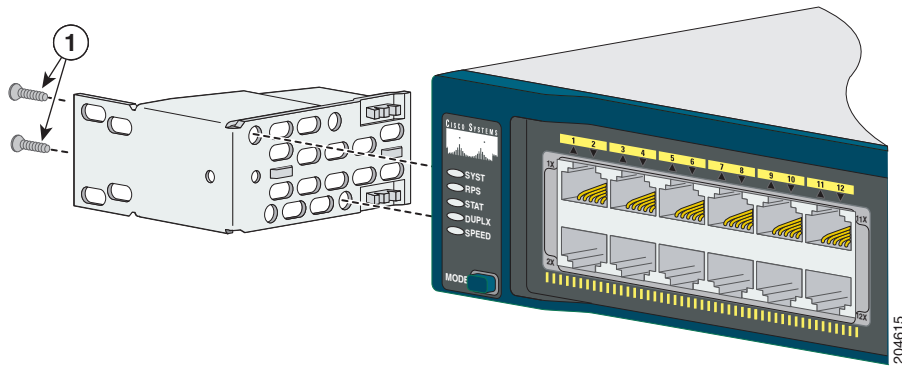


Attaching Brackets to the Catalyst 2960 Switch

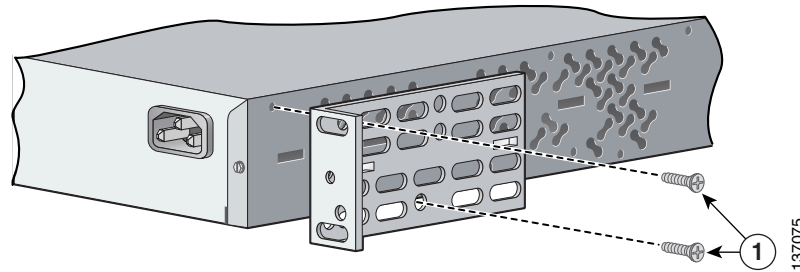
The bracket orientation and the brackets that you use depend on whether you are attaching the brackets for a 19-inch or a 24-inch rack. [Figure 2-2](#) to [Figure 2-7](#) show how to attach each type of bracket to one side of the switch. Follow the same steps to attach the second bracket to the opposite side.

Figure 2-2 Attaching Brackets for 19-Inch Racks to a Catalyst 2960 Switch, Front Panel Forward

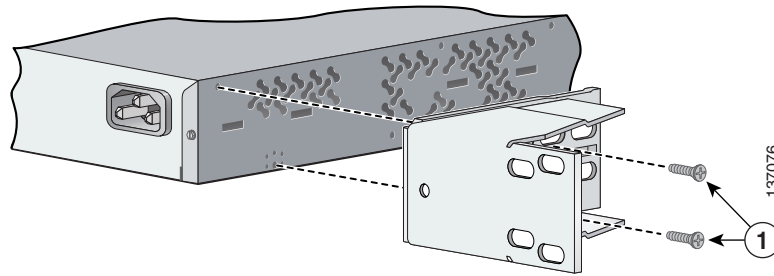
1	Phillips flat-head screws
---	---------------------------

Figure 2-3 Attaching Brackets for 24-Inch Racks to a Catalyst 2960 Switch, Front Panel Forward

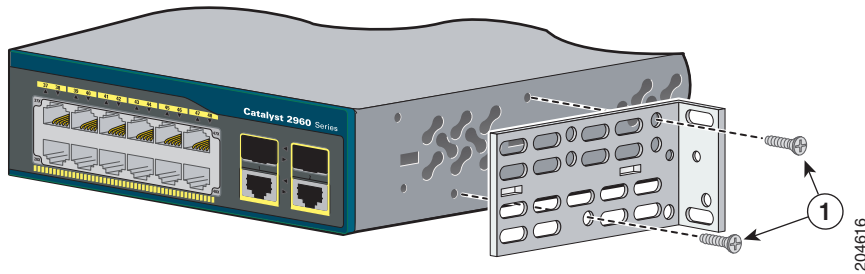
1	Phillips flat-head screws
---	---------------------------

Figure 2-4 Attaching Brackets for 19-Inch Racks to a Catalyst 2960 Switch, Rear Panel Forward

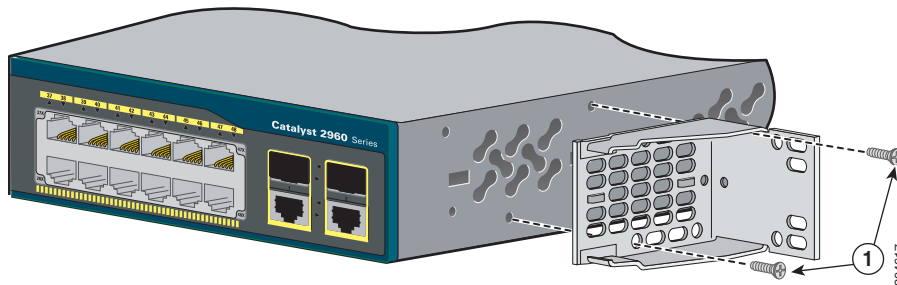
1	Phillips flat-head screws
---	---------------------------

Figure 2-5 Attaching Brackets for 24-Inch Racks to a Catalyst 2960 Switch, Rear Panel Forward

1	Phillips flat-head screws
---	---------------------------

Figure 2-6 Attaching Brackets for 19-Inch Telco Racks to a Catalyst 2960 Switch

1	Phillips flat-head screws
---	---------------------------

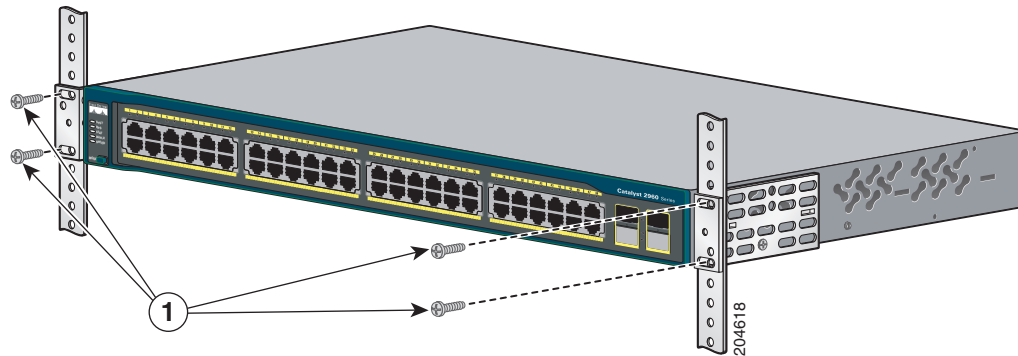
Figure 2-7 Attaching Brackets for 24-Inch Telco Racks to a Catalyst 2960 Switch

1	Phillips flat-head screws
---	---------------------------

Mounting the Switch in a Rack

After the brackets are attached to the switch, use the four supplied number-12 Phillips machine screws to securely attach the brackets to the rack, as shown in [Figure 2-8](#).

Figure 2-8 *Mounting the Catalyst 2960 Switch in a Rack*



1	Phillips machine screws
---	-------------------------

After the switch is mounted in the rack, do these tasks to complete the installation:

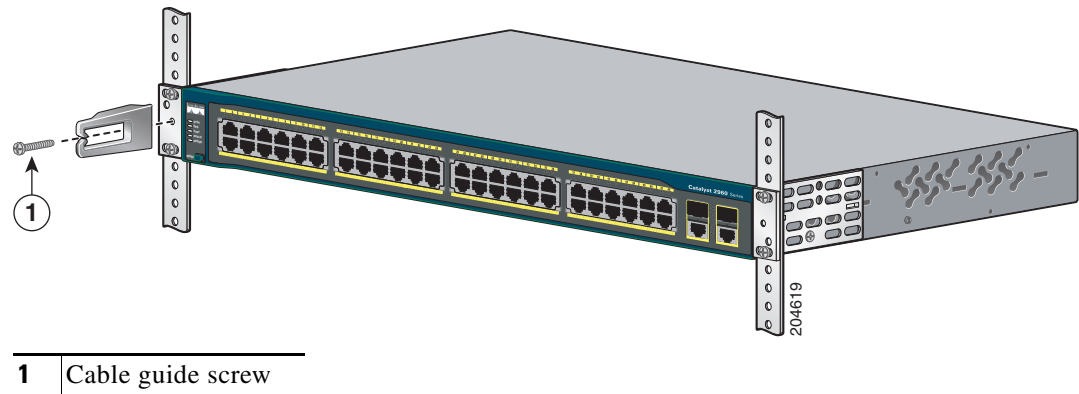
- Power on the switch. See the [“Verifying Switch Operation”](#) section on page 2-5.
- Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the *Catalyst 2960 Switch Getting Started Guide* for instructions.
- Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

For configuration instructions about using the command-line interface (CLI) setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Attaching the Cable Guide

We recommend that you attach the cable guide to prevent the cables from obscuring the front panel of the switch and the other devices installed in the rack. Use the supplied black screw shown in [Figure 2-9](#) to attach the cable guide to the left or right bracket.

Figure 2-9 Attaching the Cable Guide on the Catalyst 2960 Switch



Wall-Mounting

This section does not apply to the Catalyst 2960 8-port switches. For information applicable to those switches, see [Chapter 3, “Switch Installation \(8-Port Switches\).”](#)

To install the switch on a wall, follow the instructions in these sections:

- [Attaching the Brackets to the Switch for Wall-Mounting, page 2-12](#)
- [Attaching the RPS Connector Cover, page 2-12](#)
- [Mounting the Switch on a Wall, page 2-13](#)

Attaching the Brackets to the Switch for Wall-Mounting

Figure 2-10 shows how to attach a 19-inch bracket to one side of the switch. Follow the same steps to attach the second bracket to the opposite side.

Figure 2-10 Attaching the 19-inch Brackets for Wall-Mounting



1	Phillips truss-head screws
---	----------------------------

Attaching the RPS Connector Cover

If your switch has an RPS connector and you are not using an RPS with your switch, use the two Phillips pan-head screws to attach the RPS connector cover to the back of the switch, as shown in Figure 2-11.

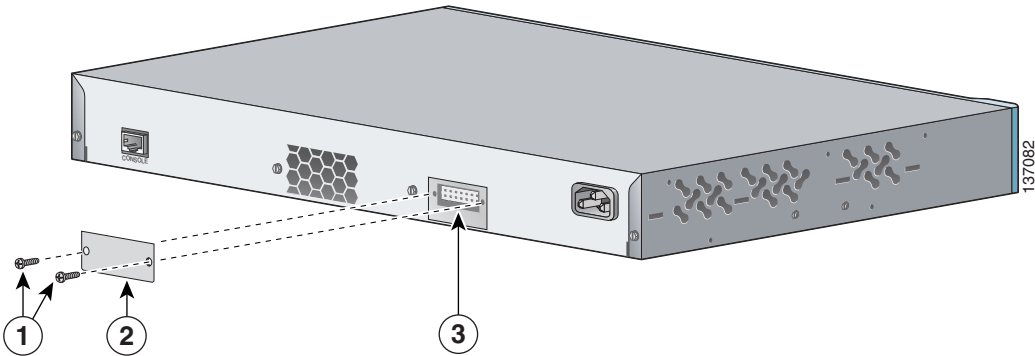

Note

The Catalyst 2960 8-port switches and the Catalyst 2960-24-S, 2960-24TC-S, 2960-48TT-S, and 2960-48TC-S switches do not have an RPS connector.


Warning

If an RPS is not connected to the switch, install an RPS connector cover on the back of the switch.
Statement 265

Figure 2-11 Attaching the RPS Connector Cover on the Catalyst 2960 Switch



1	Phillips pan-head screws	3	RPS connector
2	RPS connector cover		

Mounting the Switch on a Wall

For the best support of the switch and cables, make sure the switch is attached securely to wall studs or to a firmly attached plywood mounting backboard. Mount the switch with the front panel facing up, as shown in [Figure 2-12](#).



Warning

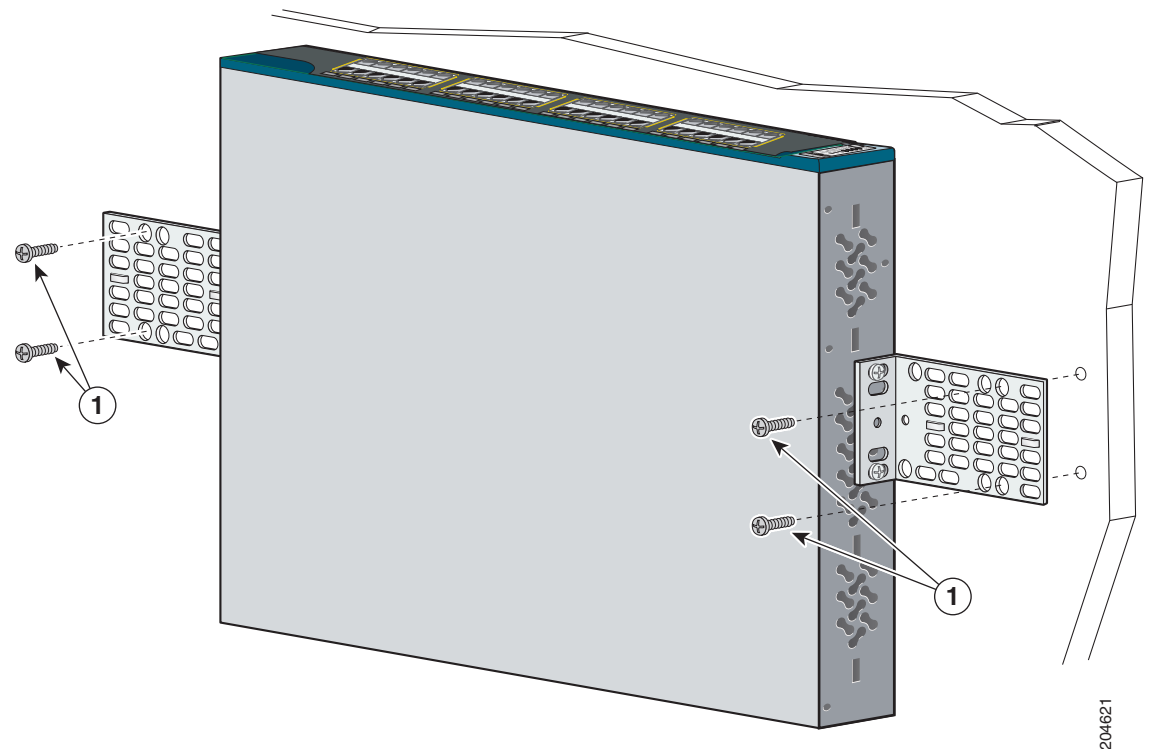
To comply with safety regulations, mount the switches on a wall with the front panel facing up.
Statement 266



Warning

If a redundant power system (RPS) is not connected to the switch, install an RPS connector cover on the back of the switch. Statement 265

Figure 2-12 *Mounting the Switch on a Wall*



1	User-supplied screws
----------	----------------------

204621

After the switch is mounted on the wall, do these tasks to complete the installation:

- Power on the switch. See the [“Verifying Switch Operation” section on page 2-5](#).
- Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the *Catalyst 2960 Switch Getting Started Guide* for instructions.
- Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports” section on page 2-14](#), the [“Connecting to SFP Modules” section on page 2-18](#), and the [“Connecting to a Dual-Purpose Port” section on page 2-20](#) to complete the installation.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Table- or Shelf-Mounting

This section applies to all switches except the Catalyst 2960-8TC-L, 2960-8TC-S, 2960G-8TC-L, and 2960PD-8TT-L switches. For information applicable to those switches, see [Chapter 3, “Switch Installation \(8-Port Switches\).”](#)

Step 1 Locate the adhesive strip with the rubber feet in the mounting-kit envelope. Attach the four rubber feet to the recessed areas on the bottom of the unit.

Step 2 Place the switch on the table or shelf near an AC power source.

After the switch is mounted on the table, do these tasks to complete the installation:

- Power on the switch. See the [“Verifying Switch Operation” section on page 2-5](#).
- Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the *Catalyst 2960 Switch Getting Started Guide* for instructions.
- Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports” section on page 2-14](#), [“Connecting to SFP Modules” section on page 2-18](#) and the [“Connecting to a Dual-Purpose Port” section on page 2-20](#) to complete the installation.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)



Note When the connectors are not being used, replace the dust covers on them for protection.

Connecting to the 10/100 and 10/100/1000 Ports

The switch 10/100/1000 ports configure themselves to operate at the speed of attached devices. If the attached ports do not support autonegotiation, you can explicitly set the speed and duplex parameters. Connecting devices that do not autonegotiate or that have their speed and duplex parameters manually set can reduce performance or result in no linkage.

To maximize performance, choose one of these methods for configuring the Ethernet ports:

- Let the ports autonegotiate both speed and duplex.
- Set the port speed and duplex parameters on both ends of the connection.

**Caution**

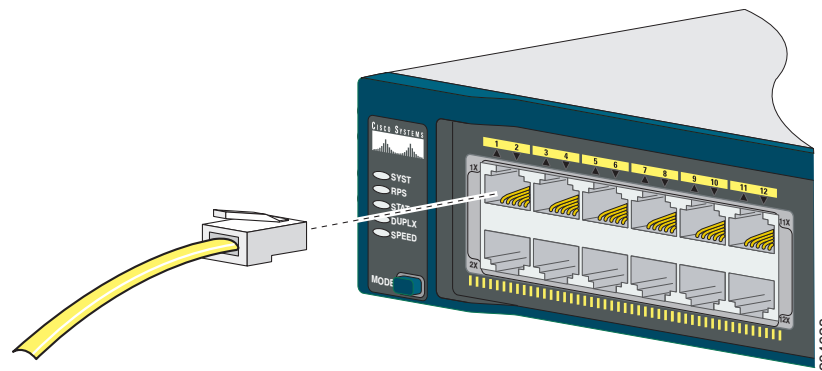
To prevent electrostatic-discharge (ESD) damage, follow your normal board and component handling procedures.

Step 1 When connecting to workstations, servers, routers, and Cisco IP Phones, connect a straight-through cable to an RJ-45 connector on the front panel. (See [Figure 2-13](#).) When connecting to switches or repeaters, use a crossover cable. (See the “[Cable and Adapter Specifications](#)” section on [page B-4](#) for cable-pinout descriptions.)

When you connect to 1000BASE-T-compatible devices, be sure to use a twisted four-pair, Category 5 or higher cable.

The auto-MDIX feature is enabled by default. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

Figure 2-13 **Connecting to an Ethernet Port**



Step 2 Connect the other end of the cable to an RJ-45 connector on the other device. The port LED turns on when both the switch and the connected device have established link.

The port LED is amber while Spanning Tree Protocol (STP) discovers the topology and searches for loops. This can take up to 30 seconds, and then the port LED turns green. If the port LED does not turn on, the device at the other end might not be turned on, or there might be a cable problem or a problem with the adapter installed in the attached device. See [Chapter 4, “Troubleshooting,”](#) for solutions to cabling problems.

Step 3 Reconfigure and reboot the connected device if necessary.

Step 4 Repeat Steps 1 through 3 to connect each device.

Installing and Removing SFP Modules

SFP modules are installed in SFP module slots on the front of the Catalyst 2960 switches. These field-replaceable modules provide the uplink optical interfaces, laser send (TX) and laser receive (RX).

You can use any combination of SFP modules. Refer to the Catalyst 2960 switch release notes for the list of SFP modules that the Catalyst 2960 switch supports. Each SFP module must be of the same type as the SFP module on the other end of the cable, and the cable must not exceed the stipulated cable length for reliable communications. See the “[SFP Module Cable Specifications](#)” section on [page B-4](#) for cable

stipulations for SFP module connections. Use only Cisco SFP modules on the Catalyst 2960 switch. Cisco SFP modules and the Catalyst 2960 switch support the Quality ID feature. Only SFP modules with the Quality ID feature are supported.

For detailed instructions on installing, removing, and cabling the SFP module, refer to your SFP module documentation.

Installing SFP Modules

Figure 2-14 shows an SFP module that has a bale-clasp latch.

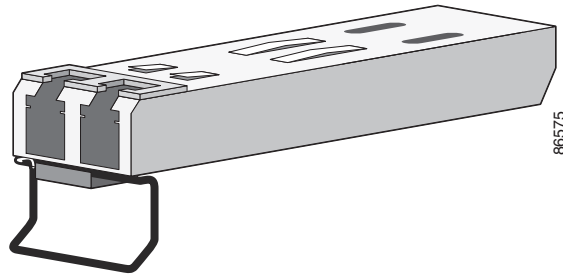


Caution

We strongly recommend that you do not install or remove the SFP module with fiber-optic cables attached to it because of the potential damage to the cables, the cable connector, or the optical interfaces in the SFP module. Disconnect all cables before removing or installing an SFP module.

Removing and installing an SFP module can shorten its useful life. Do not remove and insert SFP modules more often than is absolutely necessary.

Figure 2-14 SFP Module with a Bale-Clasp Latch



Step 1 Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.

Step 2 Find the send (TX) and receive (RX) markings that identify the top side of the SFP module.

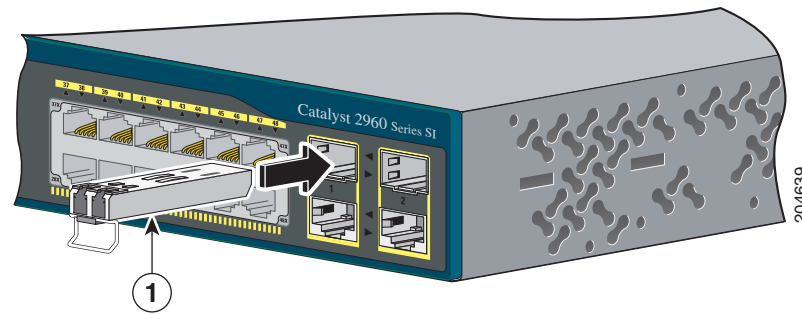


Note

On some SFP modules, the send and receive (TX and RX) markings might be replaced by arrows that show the direction of the connection, either send or receive (TX or RX).

Step 3 Align the SFP module in front of the slot opening.

Step 4 Insert the SFP module into the slot until you feel the connector on the module snap into place in the rear of the slot. See [Figure 2-15](#).

Figure 2-15 Installing an SFP Module into an SFP Module Slot

1	SFP module
----------	------------

Step 5 Remove the dust plugs from the SFP module optical ports and store them for later use.

**Caution**

Do not remove the dust plugs from the SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.

Step 6 Insert the LC cable connector into the SFP module.

Removing SFP Modules

Step 1 Attach an ESD-preventive wrist strap to your wrist and to a bare metal surface on the chassis.

Step 2 Disconnect the LC connector from the SFP module.

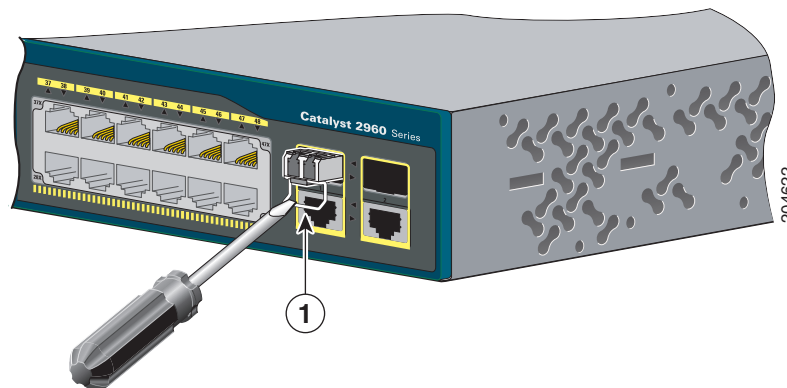
**Tip**

For reattachment, note which cable connector plug is send (TX) and which is receive (RX).

Step 3 Insert a dust plug into the optical ports of the SFP module to keep the optical interfaces clean.

Step 4 Unlock and remove the SFP module, as shown in [Figure 2-16](#).

If the module has a bale-clasp latch, pull the bale out and down to eject the module. If the bale-clasp latch is obstructed and you cannot use your index finger to open it, use a small, flat-blade screwdriver or other long, narrow instrument to open the bale-clasp latch.

Figure 2-16 Removing a Bale-Clasp Latch SFP Module by Using a Flat-Blade Screwdriver

1	Bale clasp
----------	------------

- Step 5** Grasp the SFP module between your thumb and index finger, and carefully remove it from the module slot.
- Step 6** Place the removed SFP module in an antistatic bag or other protective environment.

Connecting to SFP Modules

This section describes how to connect to SFP modules. For instructions on how to connect to fiber-optic SFP modules, see the [“Connecting to Fiber-Optic SFP Modules”](#) section. For instructions on how to connect to copper 1000BASE-T SFP modules, see the [“Connecting to 1000BASE-T SFP Modules”](#) section.

For instructions about how to install or remove an SFP module, see the [“Installing and Removing SFP Modules”](#) section on page 2-15.

For instructions on how to connect to a dual-purpose port, see the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20.

Connecting to Fiber-Optic SFP Modules



Warning

Class 1 laser product. Statement 1008



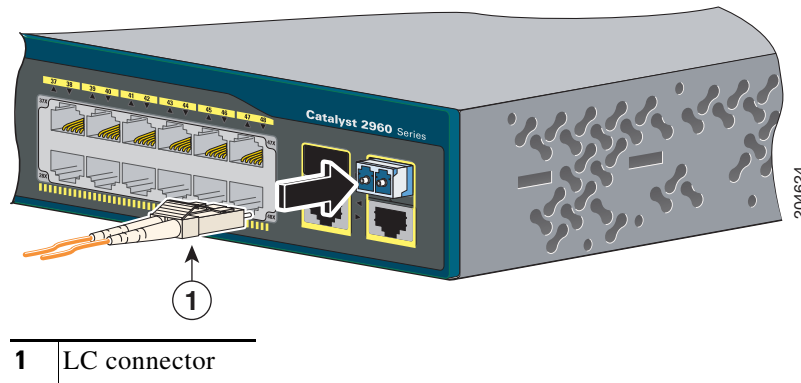
Caution

Do not remove the rubber plugs from the SFP module port or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the SFP module ports and cables from contamination and ambient light.

Before connecting to the SFP module, be sure that you understand the port and cabling stipulations in the [“Installation Guidelines”](#) section on page 2-4 and in the [“SFP Module Slots”](#) section on page 1-13. See [Appendix B, “Connector and Cable Specifications”](#) for information about the LC on the SFP module.

- Step 1** Remove the rubber plugs from the module port and fiber-optic cable, and store them for future use.
- Step 2** Insert one end of the fiber-optic cable into the SFP module port (see [Figure 2-17](#)).

Figure 2-17 Connecting to a Fiber-Optic SFP Module Port



- Step 3** Insert the other cable end into a fiber-optic receptacle on a target device.
- Step 4** Observe the port status LED.
- The LED turns green when the switch and the target device have an established link.
- The LED turns amber while the STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.
- If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be problem with the adapter installed in the target device. See [Chapter 4, “Troubleshooting,”](#) for solutions to cabling problems.
- Step 5** If necessary, reconfigure and restart the switch or target device.

Connecting to 1000BASE-T SFP Modules



Caution

To prevent ESD damage, follow your normal board and component handling procedures.

- Step 1** Insert one end of the cable into the SFP module port (see [Figure 2-18](#)). When connecting to servers, workstations, and routers, insert a four twisted-pair, straight-through cable in the RJ-45 connector. When connecting to switches or repeaters, insert a four twisted-pair, crossover cable.



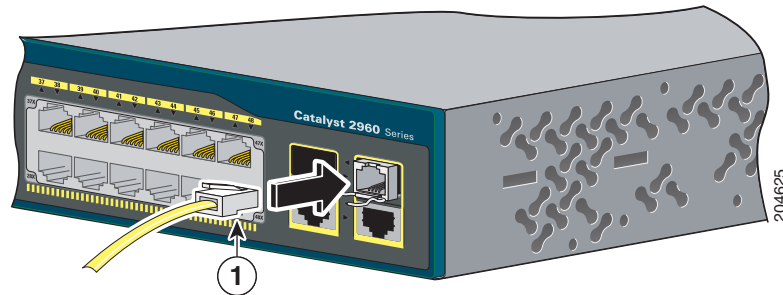
Note

When connecting to a 1000BASE-T device, be sure to use a four twisted-pair, Category 5 or higher cable.

**Note**

The auto-MDIX feature is enabled by default. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

Figure 2-18 Connecting to a 1000BASE-T SFP Module



1	RJ-45 connector
----------	-----------------

Step 2 Insert the other cable end in an RJ-45 connector on a target device.

Step 3 Observe the port status LED.

The LED turns green when the switch and the target device have an established link.

The LED turns amber while the STP discovers the network topology and searches for loops. This process takes about 30 seconds, and then the port LED turns green.

If the LED is off, the target device might not be turned on, there might be a cable problem, or there might be problem with the adapter installed in the target device. See [Chapter 4, “Troubleshooting,”](#) for solutions to cabling problems.

Step 4 If necessary, reconfigure and restart the switch or target device.

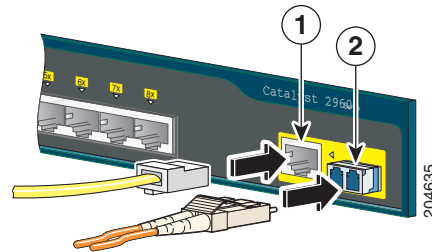
Connecting to a Dual-Purpose Port

You can configure the dual-purpose port as either a 10/100/1000 port or as an SFP module port. For a detailed description of this port, see the [“Dual-Purpose Port”](#) section on page 1-13.

Step 1 Connect an RJ-45 connector to the 10/100/1000 port, or install an SFP module into the SFP module slot, and connect a cable to the SFP module port, as shown in [Figure 2-19](#).

Only one port can be active at a time. If both ports are connected, the SFP module port has priority. You cannot configure the priority setting.

For more information about RJ-45 connectors and SFP modules, see the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, [“Installing and Removing SFP Modules”](#) section on page 2-15, and the [“Connecting to SFP Modules”](#) section on page 2-18.

Figure 2-19 Connecting to a Dual-Purpose Port

1	RJ-45 connector	2	LC connector
----------	-----------------	----------	--------------

Step 2 Connect the other end of the cable to the other device. The switch automatically detects the connection and configures the port.

By default, the switch automatically selects the interface type the first time a port links up. For subsequent links, you must use the **media-type** interface configuration command to manually configure either the RJ-45 connector or the SFP module connector. For more information, see the command reference.

Where to Go Next

If the default configuration is satisfactory, the switch does not need further configuration. You can use any of these management options to change the default configuration:

- Start the device manager, which is in the switch memory, to manage individual switches. The device manager is an easy-to-use web interface that offers quick configuration and monitoring. You can access the device manager from anywhere in your network through a web browser. For more information, see the device manager online help.
- Start the Network Assistant application, which is described in the *Getting Started with Cisco Network Assistant* guide. Through this GUI, you can configure and monitor a switch cluster or an individual switch.
- Use the CLI from the console to configure the switch as a member of a cluster or as an individual switch. See the *Catalyst 2960 Switch Software Configuration Guide* and the *Catalyst 2960 Switch Command Reference* on Cisco.com for information on using the CLI with a Catalyst 2960 switch.
- Start an SNMP application such as the CiscoView application.



CHAPTER 3

Switch Installation (8-Port Switches)

This chapter describes how to start your switch and how to interpret the power-on self-test (POST) that ensures proper operation. It also describes how to install the switch. The installation information in this chapter is specific to the Catalyst 2960-8TC-S, Catalyst 2960-8TC-L, Catalyst 2960G-8TC-L, and Catalyst 2960PD-8TT-L switches. For installation information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

Read the topics and perform the procedures in this order:

- [Preparing for Installation, page 3-1](#)
- [Verifying Switch Operation, page 3-5](#)
- [Installing the Switch, page 3-5](#)
- [Where to Go Next, page 3-18](#)

For information about connecting to the switch, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

Preparing for Installation

This section covers these topics:

- [Warnings, page 3-1](#)
- [Installation Guidelines, page 3-3](#)
- [Equipment That You Supply, page 3-4](#)
- [Box Contents, page 3-5](#)
- [Tools and Equipment, page 3-5](#)

Warnings

These warnings are translated into several languages in the *Regulatory Compliance and Safety Information for the Catalyst 2960 Switch* guide.



Warning

To prevent the switch from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of 113°F (45°C). To prevent airflow restriction, allow at least 3 inches (7.6 cm) of clearance around the ventilation openings. Statement 17B

**Warning**

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals. Statement 43

**Warning**

Do not stack the chassis on any other equipment. If the chassis falls, it can cause severe bodily injury and equipment damage. Statement 48

**Warning**

Ethernet cables must be shielded when used in a central office environment. Statement 171

**Warning**

Warning statement 353 applies only to the Catalyst 2960PD-8TT-L switch:

**Warning**

This product must be connected to a power-over-ethernet (PoE) IEEE 802.3af compliant power source or an IEC60950 compliant limited power source. Statement 353

**Warning**

Do not work on the system or connect or disconnect cables during periods of lightning activity. Statement 1001

**Warning**

Read the installation instructions before connecting the system to the power source. Statement 1004

**Warning**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- **This unit should be mounted at the bottom of the rack if it is the only unit in the rack.**
- **When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.**
- **If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.** Statement 1006

**Warning**

Class 1 laser product. Statement 1008

**Warning**

The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. Statement 1019

**Warning**

This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

**Warning**

Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040.

**Warning**

For connections outside the building where the equipment is installed, the following ports must be connected through an approved network termination unit with integral circuit protection: 10/100/1000 Ethernet. Statement 1044

**Warning**

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046

**Warning**

No user-serviceable parts inside. Do not open. Statement 1073

**Warning**

Installation of the equipment must comply with local and national electrical codes. Statement 1074

Installation Guidelines

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\)”](#).

When you determine where to place the switch, be sure to observe these requirements:

- The operating environment must be within the ranges listed in [Appendix A, “Technical Specifications.”](#)
- Airflow around the switch and through the vents must be unrestricted.
We strongly recommend that you allow at least 3 inches (7.6 cm) of clearance around the ventilation openings.
- Temperature around the unit does not exceed 113°F (45°C).
If the switch is installed in a closed environment or in a multirack assembly, the temperature around it might be greater than normal room temperature.
- Humidity around the switch must not exceed 85 percent.
- Altitude at the installation site must not be greater than 10,000 feet (3,049 meters).
- The bottom of the switch might be hot to the touch if the switch is operating at its maximum temperature 113°F (45°C) and is in an environment that exceeds normal room temperature (such as in a closet, in a cabinet, or in a closed or multirack assembly).
- Do not place any items on the top of the switch.

- Do not stack switches or place switches side-by-side unless they are separated on all sides by at least 3 inches (7.6 cm) of clearance from each other.
- Allow at least 1.75 inches (4 cm) of clearance above each switch in the rack.
- Do not wall-mount the switch with its front panel facing up or sideways. According to safety regulations, wall-mount the switch with its front panel facing down to prevent airflow restriction and to provide easier access to the cables.
- Clearance to the switch front and rear panels meets these conditions
 - You can easily read the front-panel indicators.
 - Access to ports is sufficient for unrestricted cabling.
 - The AC power cord can reach from the AC power outlet to the connector on the switch rear panel.
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures. Make sure the cabling is safely away from other devices that might damage the cables.
- For 10/100/1000 ports, cable lengths from the switch to connected devices must be 328 feet (100 meters).
- The cables meet the specifications in [Table B-1 on page B-5](#), which lists the cable specifications for 1000BASE-X and 100BASE-X small form-factor (SFP) modules available for the Catalyst 2960 switch.

When you use shorter lengths of single-mode fiber-optic cable, you might need to insert an inline optical attenuator in the link to avoid overloading the receiver.

When the fiber-optic cable span is less than 15.43 miles (25 km), you should insert a 5-decibel (dB) or 10-dB inline optical attenuator between the fiber-optic cable plant and the receiving port on the 1000BASE-ZX SFP module at each end of the link.

Equipment That You Supply

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

You need this equipment to install the switch:

- Number-2 Phillips screwdriver
- Drill with a #27 drill bit (0.144-inch [3.7 mm])

You can order an optional cable guard to secure cables to the front of the switch and prevent them from being accidentally removed. To order a cable guard, contact your Cisco representative and use these part numbers:

- Catalyst 2960-8TC-L, 2960-8TC-S, and 2960PD-8TT-L switches cable guard part number: CBLGRD-C2960-8TC=
- Catalyst 2960G-8TC-L switch cable guard part number: CBLGRD-C2960G-8TC=

The cable guard is a different part than the cable guide, which you can use to manage a large number of cables in a rack on switches other than the Catalyst 2960-8TC-L and Catalyst 2960G-8TC-L switches.

The switch has security slots in the left and right side panels. You can install an optional cable lock, such as the type that is used to secure a laptop computer, to secure either or both sides of the switch. Cable locks are available from most computer accessory suppliers.

Installing the Catalyst 2960 8-port switches in a 19-inch rack requires an optional bracket kit that is not included with the switch. You can order a kit containing the 19-inch rack-mounting brackets and hardware from Cisco. The kit part number is RCKMNT-19-CMPCT=.

If you want to connect a terminal to the switch console port, you need to provide an RJ-45-to-DB-25 female DTE adapter. You can order a kit (part number ACS-DSBUASYN=) with that adapter from Cisco.

Box Contents

The switch getting started guide on Cisco.com describes the box contents. If any item is missing or damaged, contact your Cisco representative or reseller for support.

Tools and Equipment

You need to supply a number-2 Phillips screwdriver to rack-mount the switch.

Verifying Switch Operation

Before installing the switch in a rack, or on a desk, a shelf, or a wall, you should power on the switch and verify that it passes POST.

To power on the switch, connect one end of the AC power cord to the AC power connector on the switch, and connect the other end of the power cord to an AC power outlet.

You can power the Catalyst 2960PD-8TT-L switch through a 10/100/1000 uplink port, which can receive power from an upstream PoE switch. You can also connect the switch to an AC power adapter on the rear panel. See the [“Power Input Port \(Catalyst 2960PD-8TT-L Switch\)” section on page 1-14](#) for more information.

As the switch powers on, it begins the POST, a series of tests that runs automatically to ensure that the switch functions properly. LEDs can blink during the test. POST lasts approximately 1 minute. When the switch begins POST, the System, Status, Duplex, and Speed LEDs turn green. The System LED blinks green, and the other LEDs remain solid green.

When the POST completes successfully, the System LED remains green. The other LEDs turn off and then reflect the switch operating status. If a switch fails POST, the System LED turns amber.

POST failures are usually fatal. Call Cisco technical support representative if your switch fails POST.

After a successful POST, disconnect the power cord from the switch. Install the switch in a rack, or on a desk, a shelf, or a wall, as described in the [“Installing the Switch” section on page 3-5](#).

Installing the Switch

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

This section describes these installation procedures:

- [Desk- or Shelf-Mounting \(without Mounting Screws\), page 3-6](#)
- [Desk- or Shelf-Mounting \(with Mounting Screws\), page 3-7](#)
- [Under the Desk- or Shelf-Mounting \(with Mounting Screws\), page 3-8](#)

- [Wall-Mounting \(with Mounting Screws\)](#), page 3-11
- [Magnet Mounting](#), page 3-14
- [Rack-Mounting](#), page 3-15
- [Wall-Mounting \(with Rack-Mount Brackets\)](#), page 3-16

Desk- or Shelf-Mounting (without Mounting Screws)

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\)”](#).

The switch can be installed on top of a desk or shelf with or without mounting screws. If you do not want to use the mounting screws, follow these steps:

-
- Step 1** Locate the adhesive strip with the rubber feet in the accessory kit.
- Step 2** Remove the four rubber feet from the adhesive strip, and attach them to the recessed areas on the bottom of the unit. This prevents the switch from sliding on the desk or shelf.



Note We strongly recommend that you attach the rubber feet. Doing so helps prevent airflow restriction and overheating.

- Step 3** Place the switch on the desk or shelf.



Note We strongly recommend that you allow at least 3 inches (7.6 cm) of clearance around the ventilation openings to prevent airflow restriction and overheating.

Do not stack switches or place switches side-by-side unless they are separated on all sides by at least 3 inches (7.6 cm) of clearance from each other.

Do not place any items on the top of the switch.

After the switch is mounted on the desk or shelf, do these tasks to complete the installation:

1. Power on the switch. See the [“Verifying Switch Operation”](#) section on page 3-5.
2. Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the switch getting started guide for instructions.
3. Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

For configuration instructions about using the command-line interface (CLI) setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Desk- or Shelf-Mounting (with Mounting Screws)

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\)”](#).

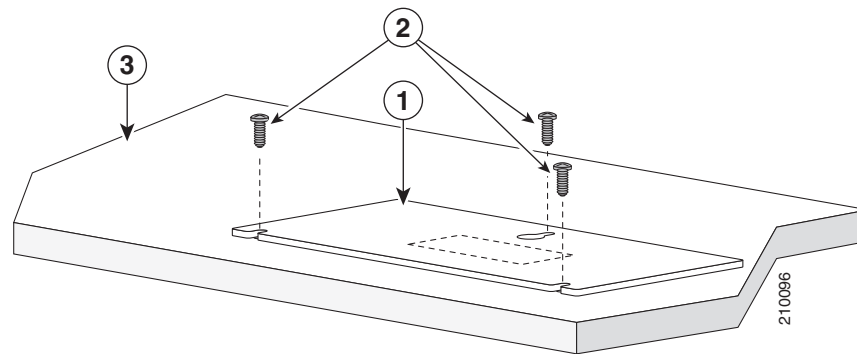
The switch can be secured to a desk or shelf with mounting screws.

- Step 1** Locate the screw template. You can use the template to align the mounting screw holes and also as a guide to make sure that you install the screws into the desk or shelf with proper clearance.
- Step 2** Position the screw template on top of the desk or shelf so that the two side-by-side slots face the *front* of the desk or shelf, as shown in [Figure 3-1](#). This ensures that the power cord faces the *rear* of the desk or shelf after the switch is installed.



Note Wait before you attach the screw template to the desk or shelf.

Figure 3-1 Installing the Mounting Screws on Top of a Desk or Shelf



1	Screw template	3	Desk or shelf
2	Screws		

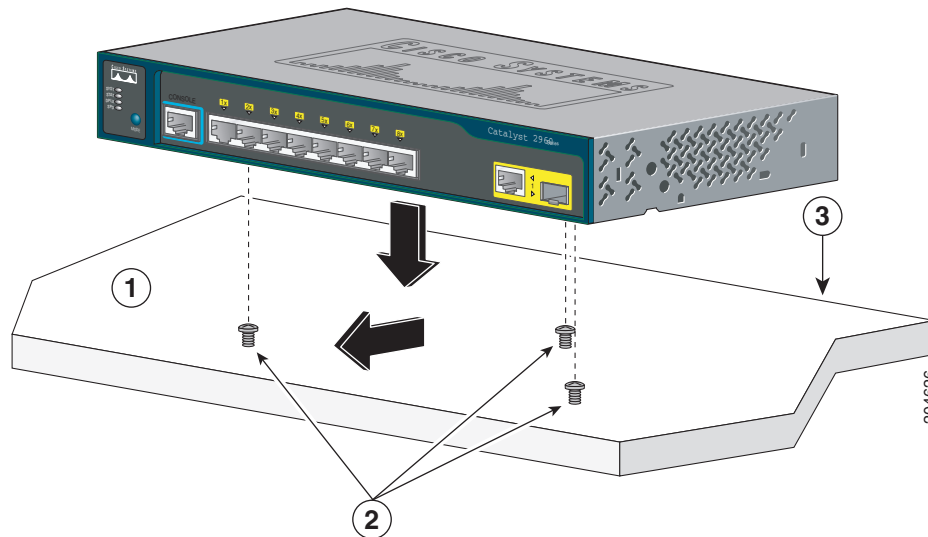
- Step 3** Peel the adhesive strip off the bottom of the screw template, and attach it to the top of the desk or shelf.
- Step 4** Use a 0.144-inch (3.7 mm) or a #27 drill bit to drill a 1/2-inch (12.7 mm) hole in the three screw template slots.
- Step 5** Insert three screws in the slots on the screw template, and tighten them until they touch the top of the screw template.
- Step 6** Remove the screw template from the desk or shelf.
- Step 7** Place the switch onto the mounting screws, and slide the switch forward until it locks in place, as shown in [Figure 3-2](#).



Note We strongly recommend that you allow at least 3 inches (7.6 cm) of clearance around the ventilation openings to prevent airflow restriction and overheating.

Do not stack switches or place switches side-by-side unless they are separated on all sides with at least 3 inches (7.6 cm) of clearance from each other.

Do not place any items on the top of the switch.

Figure 3-2 *Mounting the Switch on Top of a Desk or Shelf*

1	Slides on this way	3	Desk or shelf
2	Screws		

After the switch is mounted on the desk or shelf, do these tasks to complete the installation:

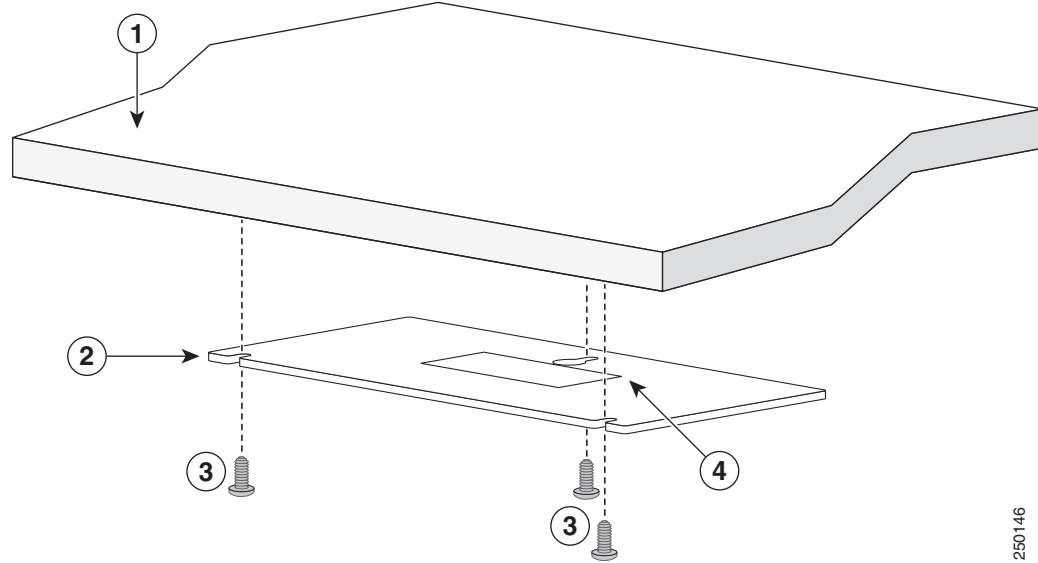
1. Power on the switch. See the [“Verifying Switch Operation”](#) section on page 3-5.
2. Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the switch getting started guide for instructions.
3. Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Under the Desk- or Shelf-Mounting (with Mounting Screws)

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

- Step 1** Locate the screw template. The template is used to align the mounting screw holes and is also used as a guide to make sure the screws are installed under the desk or shelf with proper clearance.
- Step 2** Position the screw template underneath the desk or shelf so that the two side-by-side slots face the *front* of the desk or shelf, as shown in [Figure 3-3](#). This ensures that the power cord faces the *rear* of the desk or shelf after the switch is installed.
- Step 3** Peel the adhesive strip off the bottom of the screw template, and attach it to the underside of the desk or shelf.

Figure 3-3 *Installing the Mounting Screws Under a Desk or Shelf*

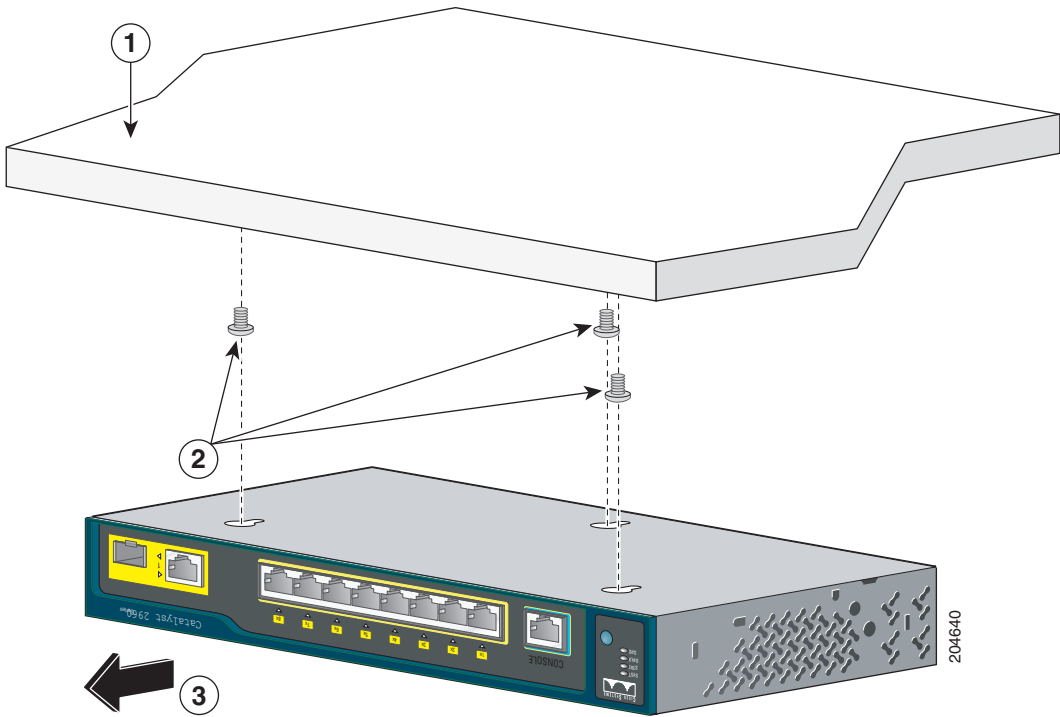
1	Desk or shelf	3	Screws
2	Screw template	4	Adhesive

- Step 4** Use a 0.144-inch (3.7 mm) or a #27 drill bit to drill a 1/2-inch (12.7 mm) hole in the three screw template slots.
- Step 5** Insert three screws in the slots on the screw template, and tighten until they touch the top of the screw template.
- Step 6** Remove the screw template from underneath the desk or shelf.
- Step 7** Place the switch onto the mounting screws, and slide the switch forward until it locks in place, as shown in [Figure 3-4](#).

**Note**

We strongly recommend that you allow at least 3 inches (7.6 cm) of clearance around the ventilation openings to prevent airflow restriction and overheating.

Figure 3-4 Mounting the Switch Under a Desk or Shelf



1	Desk or shelf	3	Slides on this way
2	Screws		

After the switch is mounted under the desk or shelf, do these tasks to complete the installation:

1. Power on the switch. See the [“Verifying Switch Operation”](#) section on page 3-5.
2. Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the switch getting started guide for instructions.
3. Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Wall-Mounting (with Mounting Screws)

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

The steps in this section show how to mount the switch with the front panel facing down (as shown in [Figure 3-5 on page 3-12](#) and [Figure 3-6 on page 3-13](#).)



Warning

Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378



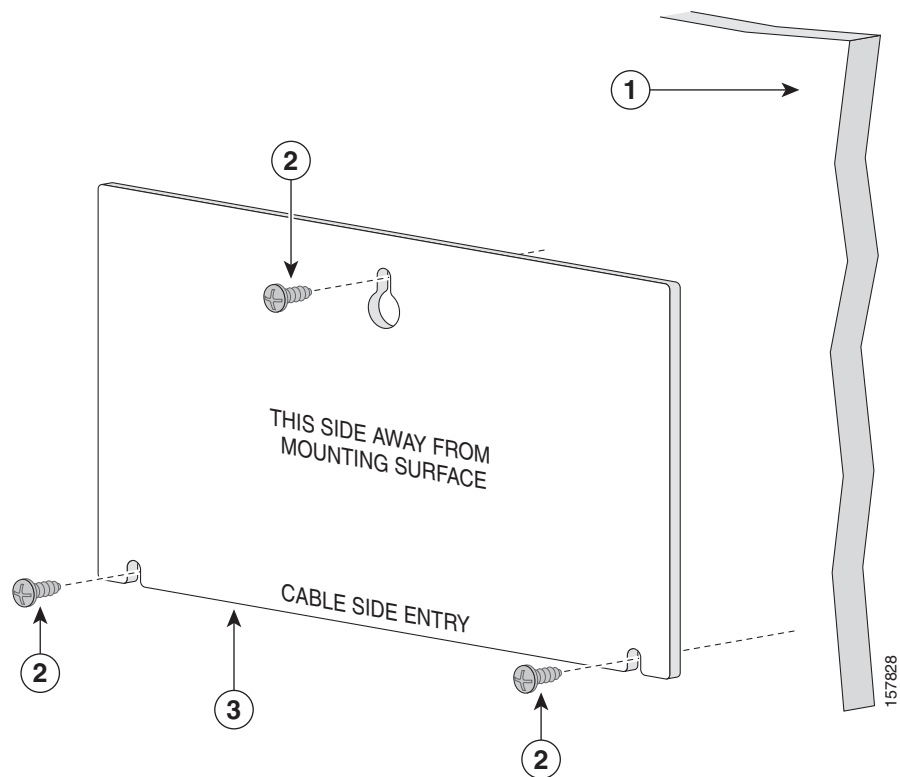
Note

Do not wall-mount the switch with its front panel facing up or sideways. According to safety regulations, wall-mount the switch with its front panel facing down to prevent airflow restriction and to provide easier access to the cables.

Follow the steps in this section to install the switch to a wall:

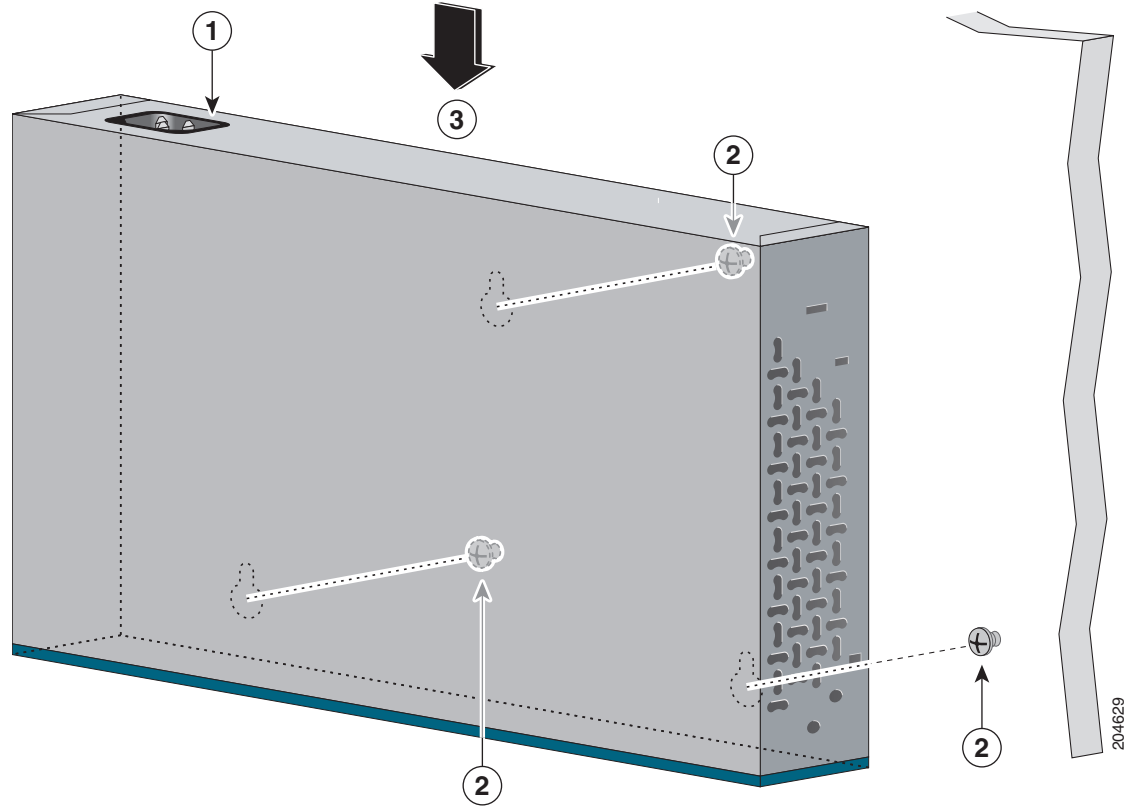
-
- Step 1** Locate the screw template. The template is used to align the mounting screw holes.
- Step 2** Position the screw template so that the two side-by-side slots face toward the floor, as shown in [Figure 3-5](#).
- For the best support of the switch and cables, make sure that you attach the switch securely to a wall stud or to a firmly attached plywood mounting backboard.
- Step 3** Peel the adhesive strip off the bottom of the screw template.

Figure 3-5 Installing the Mounting Screws on a Wall



1	Wall	3	Screw template
2	Screws		

- Step 4** Attach the screw template to the wall.
- Step 5** Use a 0.144-inch (3.7 mm) or a #27 drill bit to drill a 1/2-inch (12.7 mm) hole in the three screw template slots.
- Step 6** Insert three screws in the slots on the screw template, and tighten until they touch the top of the screw template.
- Step 7** Remove the screw template from the wall.
- Step 8** Place the switch onto the mounting screws, and slide it down until it locks in place, as shown in [Figure 3-6](#).

Figure 3-6 *Installing the Switch On a Wall*

1	Switch	3	Slides on this way
2	Screw		

After the switch is mounted on the wall, do these tasks to complete the installation:

1. Power on the switch. See the [“Verifying Switch Operation”](#) section on page 3-5.
2. Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the switch getting started guide for instructions.
3. Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

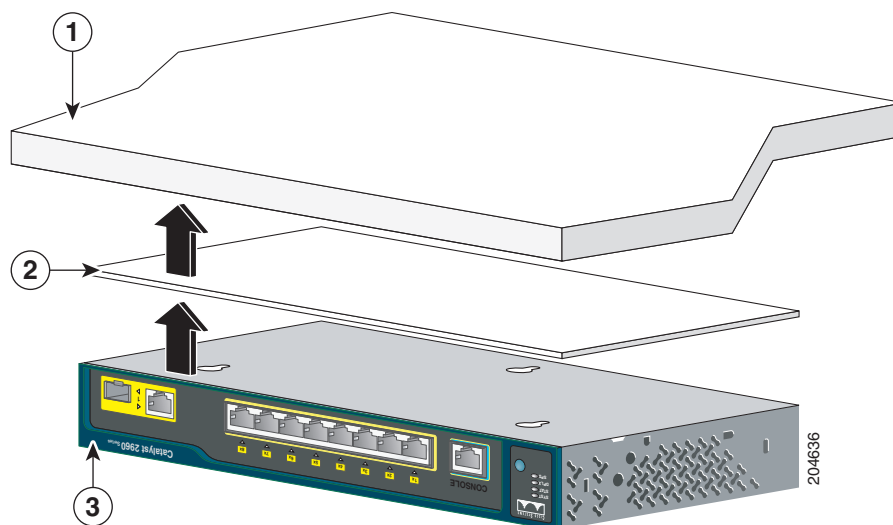
For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Magnet Mounting

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

- Step 1** Place one side of the magnet against the bottom of the switch, as shown in [Figure 3-7](#).

Figure 3-7 Mounting the Switch with a Magnet



1	Metal surface	3	Switch
2	Magnet		

- Step 2** Mount the magnet and switch on a metal surface.

After the switch is attached to the mounting magnet, do these tasks to complete the installation:

1. Power on the switch. See the [“Verifying Switch Operation”](#) section on page 3-5.
2. Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the switch getting started guide for instructions.
3. Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Rack-Mounting

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

Installing the Catalyst 2960 8-port switches in a 19-inch rack requires an optional bracket kit that is not included with the switch. You can order a kit containing the 19-inch rack-mounting brackets and hardware from Cisco. The kit part number is RCKMNT-19-CMPCT=.



Warning

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack. Statement 1006

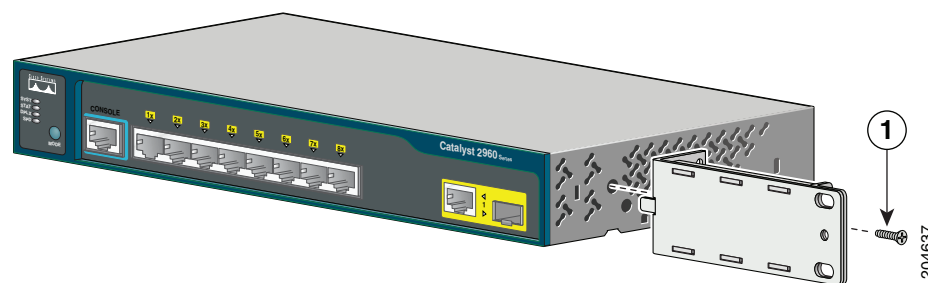
To install the switch in a 19-inch rack, follow the instructions described in these sections:

- [Attaching Brackets to the Switch, page 3-15](#)
- [Mounting the Switch in a 19-Inch Rack, page 3-16](#)

Attaching Brackets to the Switch

[Figure 3-8](#) shows how to attach a 19-inch bracket to one side of the switch. Follow the same steps to attach the second bracket to the opposite side.

Figure 3-8 Attaching the 19-inch Brackets for Rack-Mounting



- | | |
|----------|--------------------------|
| 1 | Phillips flat-head screw |
|----------|--------------------------|

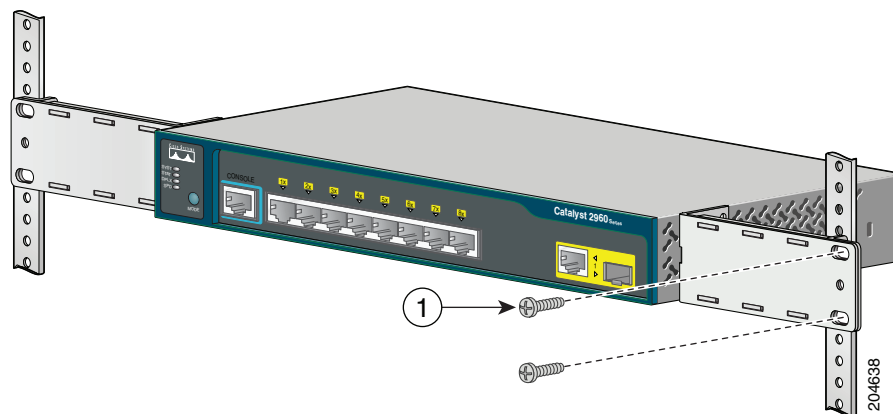
Mounting the Switch in a 19-Inch Rack

After the brackets are attached to the switch, insert the switch into the 19-inch rack, and align the bracket in the rack. Use either the 10-32 pan-head screws or the 12-24 pan-slotted screws to secure the switch in the rack, as shown in [Figure 3-9](#).

**Note**

We strongly recommend that you allow at least 1.75 inches (4 cm) of clearance above each switch in the rack.

Figure 3-9 *Mounting the Switch in a 19-Inch Rack*



- | | |
|---|-------------------------|
| 1 | Phillips machine screws |
|---|-------------------------|

After the switch is mounted in the rack, do these tasks to complete the installation:

1. Power on the switch. See the [“Verifying Switch Operation”](#) section on page 3-5.
2. Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the switch getting started guide for instructions.
3. Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Wall-Mounting (with Rack-Mount Brackets)

To install the Catalyst 2960 8-port switches in a 19-inch rack requires an optional bracket kit that is not included with the switch. You can order a kit containing the 19-inch rack-mounting brackets and hardware from Cisco. The kit part number is RCKMNT-19-CMPCT=.

This section is specific to the Catalyst 2960 8-port switches. For information applicable to the other Catalyst 2960 switches, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\).”](#)

**Warning**

Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378

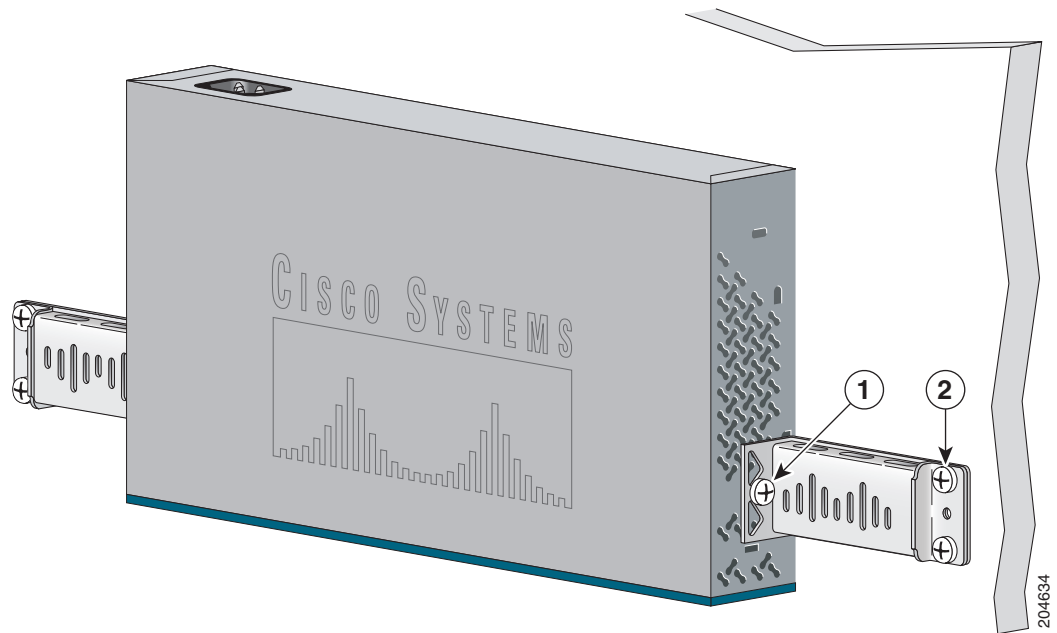
Step 1 Attach a 19-inch bracket to one side of the switch. Follow the same steps to attach the second bracket to the opposite side, as shown in [Figure 3-10](#).

Step 2 Mount the switch with the front panel facing down, as shown in [Figure 3-10](#).

For the best support of the switch and cables, make sure the switch is attached securely to wall studs or to a firmly attached plywood mounting backboard.

Do not wall-mount the switch with its front panel facing up or sideways according to safety regulations. Wall-mount the switch with its front panel facing down to prevent airflow restriction and to provide easier access to the cables.

Figure 3-10 *Mounting the Switch on a Wall*



1	Phillips flat-head screw	2	User-supplied screws
----------	--------------------------	----------	----------------------

After the switch is mounted on the wall, do these tasks to complete the installation:

1. Power on the switch. See the [“Verifying Switch Operation”](#) section on page 3-5.
2. Connect to a 10/100 or 10/100/1000 port, and run Express Setup. See the switch getting started guide for instructions.
3. Connect to the front-panel ports. See the [“Connecting to the 10/100 and 10/100/1000 Ports”](#) section on page 2-14, the [“Connecting to SFP Modules”](#) section on page 2-18, and the [“Connecting to a Dual-Purpose Port”](#) section on page 2-20 to complete the installation.

For configuration instructions about using the CLI setup program, go to [Appendix C, “Configuring the Switch with the CLI-Based Setup Program.”](#)

Where to Go Next

If the default configuration is satisfactory, the switch needs no further configuration. You can use any of these management options to change the default configuration:

- Start the device manager, which is in the switch memory, to manage individual and standalone switches. The device manager is a web interface that offers quick configuration and monitoring. You can access the device manager from anywhere in your network through a web browser. For more information, see the device manager online help.
- Start the Network Assistant application, which is described in the *Getting Started with Cisco Network Assistant* guide. Through this GUI, you can configure and monitor a switch cluster or an individual switch.
- Use the CLI from the console to configure the switch as a member of a cluster or as an individual switch. See the *Catalyst 2960 Switch Software Configuration Guide* and the *Catalyst 2960 Switch Command Reference* on Cisco.com for information on using the CLI with a Catalyst 2960 switch.
- Start an SNMP application such as the CiscoView application.



CHAPTER 4

Troubleshooting

The LEDs on the front panel provide troubleshooting information about the switch. They show failures in the power-on self-test (POST), port-connectivity problems, and overall switch performance. For a full description of the switch LEDs, see the [“LEDs” section on page 1-14](#).

You can also get statistics from the browser interface, from the command-line interface (CLI), or from a Simple Network Management Protocol (SNMP) workstation. See the software configuration guide, the switch command reference guide on Cisco.com, or the documentation that came with your SNMP application for details.

This chapter describes these topics for troubleshooting problems:

- [Diagnosing Problems, page 4-1](#)
- [Clearing the Switch IP Address and Configuration, page 4-5](#)
- [Locating the Switch Serial Number, page 4-6](#)

Diagnosing Problems

The LEDs on the front panel provide troubleshooting information about the switch. They show POST failures, port-connectivity problems, and overall switch performance. You can also get statistics from the CLI or from an SNMP workstation. See the software configuration guide and the switch command reference on Cisco.com or the documentation that came with your SNMP application for more information.

- [“Verify Switch POST Results” section on page 4-2](#)
- [“Monitor Switch LEDs” section on page 4-2](#)
- [“Verify Switch Connections” section on page 4-2](#)
- [“Monitor Switch Performance” section on page 4-4](#)

Verify Switch POST Results

As the switch powers on, it begins the POST, a series of tests that runs automatically to ensure that the switch functions properly. It might take several minutes for the switch to complete POST.

When the switch begins POST, the system LED slowly blinks green. When POST completes, the system LED blinks amber. If POST fails, the system LED remains amber. If POST completes successfully, the system LED rapidly blinks green.

**Note**

POST failures are usually fatal. Contact your Cisco technical support representative if your switch does not pass POST.

Monitor Switch LEDs

Look at the port LEDs for troubleshooting information about the switch. See the “LEDs” section on [page 1-14](#) for a description of the LED colors and their meanings.

Verify Switch Connections

Review these sections when troubleshooting switch connectivity problems:

- [Bad or Damaged Cable, page 4-2](#)
- [Ethernet and Fiber Cables, page 4-3](#)
- [Link Status, page 4-3](#)
- [Transceiver Module Port Issues, page 4-3](#)
- [Port and Interface Settings, page 4-4](#)
- [Ping the End Device, page 4-4](#)
- [Spanning Tree Loops, page 4-4](#)

Bad or Damaged Cable

Always look at the cable for marginal damage or failure. A cable might connect at the physical layer but then cause packet corruption because of subtle damage to its wiring or connectors. You can identify this situation because the port will have many packet errors, or the port constantly loses and regains link. In these situations:

- Change the copper or fiber-optic cable with a known, good cable if necessary.
- Look for broken or missing pins on cable connectors.
- Rule out any insufficient patch panel connections or media convertors between the source and the destination. If possible, bypass the patch panel or eliminate faulty media convertors, such as fiber-optic-to-copper convertors.
- Try using the cable in another port or interface to see if the problem also exists there.

Ethernet and Fiber Cables

Make sure that you have the correct cable type for the connection:

- For Ethernet, use Category 3 copper cable for 10 Mb/s unshielded twisted pair (UTP) connections. Use either Category 5, Category 5e, or Category 6 UTP for 10/100 or 10/100/1000 Mb/s connections.
- For fiber-optic connectors, verify that you have the correct cable for the distance and port type. Make sure that the ports on the connected device match and that they use the same type of encoding, optical frequency, and fiber type. For more information about cabling, see [Appendix B, “Connector and Cable Specifications.”](#)
- For copper connections, determine if a crossover cable was used when a straight-through cable was required or the reverse. Enable auto-MDIX on the switch, or replace the cable.

Link Status

Verify that both sides have link. A single broken wire or one shutdown port can cause one side to show link, but the other side does not have link.

A link LED does not guarantee that the cable is fully functional. The cable might have encountered physical stress that causes it to function at a marginal level. If the link light for the port does not come on:

- Connect the cable from the switch to a known, good device.
- Make sure that both ends of the cable are connected to the correct ports.
- Verify that both devices have power.
- Verify that you are using the correct cable type. See [Appendix B, “Connector and Cable Specifications.”](#) for more information.
- Look for loose connections. Sometimes a cable appears to be seated, but is not. Disconnect and then reconnect the cable.

Transceiver Module Port Issues

Use only Cisco small form-factor (SFP) modules on the switch. Each Cisco module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for Cisco to identify and validate that the module meets the requirements for the switch. Look for these items:

- Bad or incorrect SFP module. Exchange the suspect module with a known, good module. Verify that this module supports this platform. See the [“Features” section on page 1-1](#) for a list of supported SFP modules.
- Use the **show interfaces** privileged EXEC command to verify the port or module error-disabled, disabled, or shutdown status. Re-enable the port if necessary.
- Make sure that all you have properly cleaned and securely connected all fiber-optic connections.

Port and Interface Settings

An obvious but sometimes overlooked cause of port connectivity failure is a disabled port. Verify that the port or interface is not disabled or for some reason powered off. If a port or interface is manually shut down on one or the other side of the link, the link does not come up until you re-enable the port. Use the **show interfaces** privileged EXEC command to verify the port or interface error-disabled, disabled, or shutdown status on both sides of the connection. If necessary, re-enable the port or the interface.

Ping the End Device

Verify the end device connection by first pinging it from the directly connected switch, and then work your way back port by port, interface by interface, trunk by trunk, until you find the source of the connectivity issue. Make sure that each switch can identify the end device MAC address in its Content-Addressable Memory (CAM) table.

Spanning Tree Loops

Spanning Tree Protocol (STP) loops can cause serious performance issues that might appear to be port or interface problems. In this situation, the switch bandwidth is used repeatedly by the same frames, crowding out legitimate traffic.

A unidirectional link can cause loops. This occurs when the traffic that the switch sends is received by its neighbor, but the switch does not receive the traffic that is sent from the neighbor. A broken fiber-optic cable, other cabling, or a port issue could cause this one-way communication.

You can enable the UniDirectional Link Detection (UDLD) protocol on the switch to help identify difficult-to-find unidirectional link problems. UDLD supports a normal mode of operation (the default) and an aggressive mode. In normal mode, UDLD detects unidirectional links because of incorrectly connected interfaces on fiber-optic connections. In aggressive mode, UDLD also detects unidirectional links caused by one-way traffic on fiber-optic and twisted-pair links and by incorrectly connected interfaces on fiber-optic links. For information about enabling UDLD on the switch, see the “Understanding UDLD” section in the software configuration guide.

Monitor Switch Performance

Review these sections when you troubleshoot switch performance problems:

- [Speed, Duplex, and Autonegotiation, page 4-4](#)
- [Autonegotiation and NIC Cards, page 4-5](#)
- [Cabling Distance, page 4-5](#)

Speed, Duplex, and Autonegotiation

If the port statistics show a large number of alignment errors, frame check sequence (FCS), or late-collisions errors, a speed or duplex mismatch might be the problem.

A common issue with speed and duplex occurs when the duplex settings are mismatched between two switches, between a switch and a router, or between the switch and a workstation or server. This can happen when you manually set the speed and duplex or because of autonegotiation issues between the two devices.

These circumstances can result in a mismatch:

- A manually set speed or duplex parameter is different from the manually set speed or duplex parameter on the connected port.
- A port is set to autonegotiate, and the connected port is set to full duplex with no autonegotiation.

To maximize switch performance and to ensure a link, follow one of these guidelines when you set or change the settings for duplex and speed:

- Let both ports autonegotiate both speed and duplex.
- Manually set the speed and duplex parameters for the ports on both ends of the connection.
- If a remote device does not autonegotiate, configure the duplex settings on the two ports to match. The speed parameter can adjust itself even if the connected port does not autonegotiate.

Autonegotiation and NIC Cards

Problems sometimes occur between the switch and third-party network interface cards (NICs). By default, the switch ports and interfaces are set to autonegotiate. It is common for devices such as laptop computers or other devices to also be set to autonegotiate, yet sometimes autonegotiation issues occur.

To troubleshoot autonegotiation problems, try to manually set both sides of the connection. If this does not solve the problem, the firmware or software on your NIC card might be causing the problem. Upgrade the NIC card driver to the latest version available from the manufacturer.

Cabling Distance

If the port statistics show excessive FCS, late-collision, or alignment errors, verify that the cable distance from the switch to the connected device meets the recommended guidelines. See [Appendix B, “Cable and Adapter Specifications.”](#) for cabling guidelines.

Clearing the Switch IP Address and Configuration

If you have configured a new switch with an incorrect IP address, you can clear the IP address that is configured on the switch.



Caution

This procedure clears the IP address and all configuration information that is stored on the switch. Do not follow this procedure unless you want to completely reconfigure the switch.

Follow these steps to return your switch to the factory default settings:

1. Press and hold the Mode button (see [Figure 1-23 on page 1-15](#)).

The switch LEDs begin blinking after about 2 seconds. If the switch is not configured, the LEDs above the mode button turn green. You can omit this step and run Express Setup to configure the switch.

2. Continue holding down the Mode button. The LEDs stop blinking after an additional 8 seconds, and then the switch reboots.

The switch now behaves like an unconfigured switch. You can configure the switch by using Express Setup as described in the switch getting started guide that is included with the switch.

You can also configure the switch by using the CLI setup procedure described in [Appendix C](#), “Configuring the Switch with the CLI-Based Setup Program.”

Locating the Switch Serial Number

If you contact Cisco Technical Assistance, you need to know the serial number of your switch. See [Figure 4-1](#) through [Figure 4-3](#) to locate the serial number on your switch. You can also use the **show version** command to get the serial number.

Figure 4-1

Serial Number Location on the Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-24LT-L, 2960-Plus 48PST-L, 2960-48PST-L, 2960-24TT-L, 2960-48TT-S, 2960-48TT-L, 2960G-24TC-L, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-L, 2960-Plus 24LC-S, 2960-24LC-S, 2960-Plus 48PST-S, 2960-48PST-S, and 2960G-48TC-L Switches

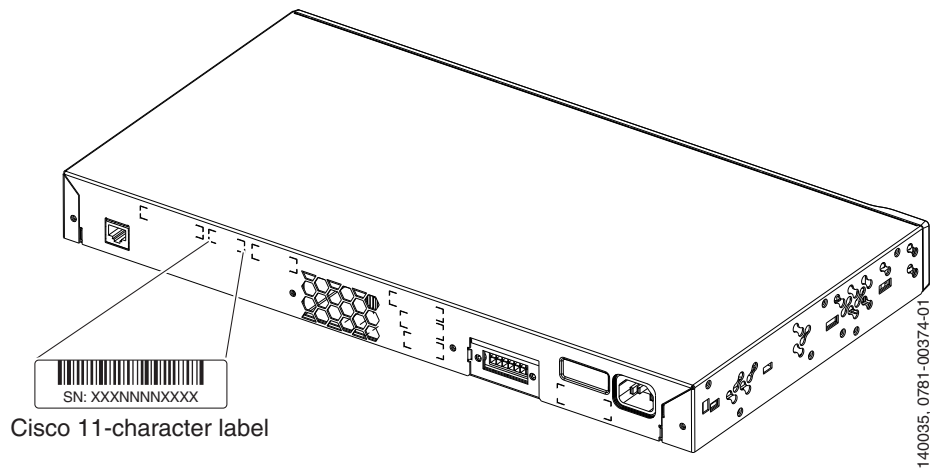


Figure 4-2

Serial Number Location on the Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, and 2960-48TC-S Switches

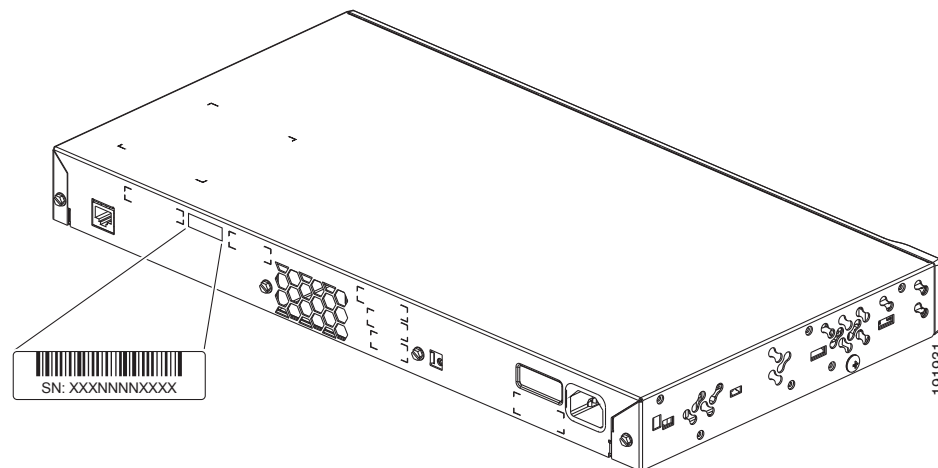
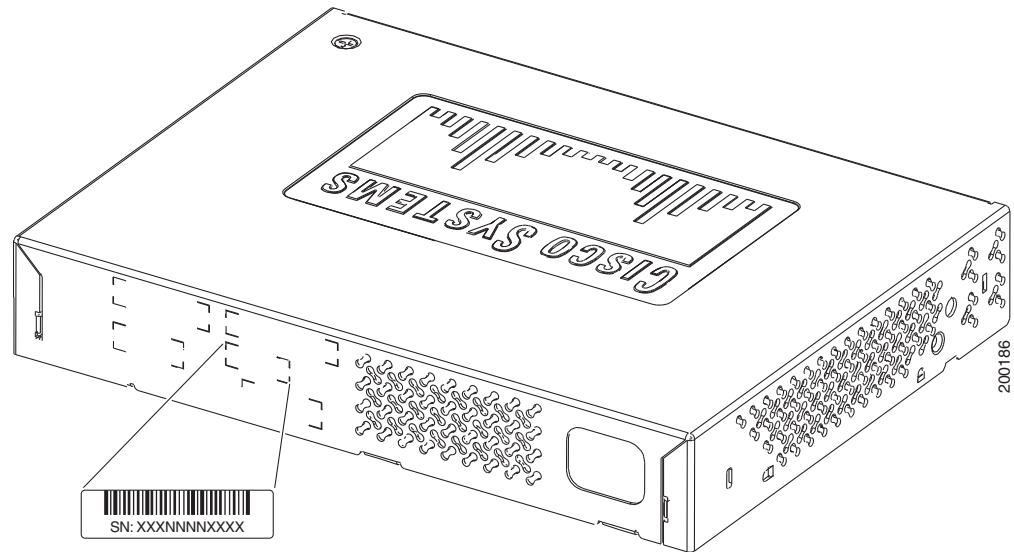


Figure 4-3 Serial Number Location on the Catalyst 2960-8TC-L, Catalyst 2960G-8TC-L, Catalyst 2960-8TC-S, and Catalyst 2960PD-8TT-L Switches





APPENDIX A

Technical Specifications

These tables list the technical specifications for the Catalyst 2960 switches:

- [Table A-1 on page A-1, Environmental Specifications for All Catalyst 2960 Switches](#)
- [Table A-2 on page A-2, Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, and 2960-48TC-S Switch Specifications](#)
- [Table A-3 on page A-2, Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-24LT-L, 2960-Plus 48PST-L, and 2960-48PST-L Switch Specifications](#)
- [Table A-4 on page A-3, Catalyst 2960-Plus 24TC-L, 2960-24TC-L and 2960-24TT-L Switch Specifications](#)
- [Table A-5 on page A-3, Catalyst 2960-Plus 48TC-L, 2960-48TC-L, 2960-48TT-S, and 2960-48TT-L Switch Specifications](#)
- [Table A-6 on page A-4, Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L Switch Specifications](#)
- [Table A-7 on page A-4, Catalyst 2960-8TC-L, 2960G-8TC-L, 2960-8TC-S, and 2960PD-8TT-L Switch Specifications](#)
- [Table A-8 on page A-5, Catalyst 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S Switch Specifications](#)

Table A-1 **Environmental Specifications for All Catalyst 2960 Switches**

Environmental Ranges (All)	
Operating temperature	23 to 113°F (–5 to 45°C) up to 5,000 ft (1500 m) 23 to 104°F (–5 to 40°C) up to 10,000 ft (3000 m)
Storage temperature	–13 to 158°F (–25 to 70°C)
Relative humidity	10 to 85% (noncondensing)
Operating altitude	Up to 10,000 ft (3049 m)
Storage altitude	Up to 15,000 ft (4573 m)

Table A-2 Catalyst 2960-24-S, 2960-Plus 24TC-S, 2960-24TC-S, 2960-Plus 48TC-S, and 2960-48TC-S Switch Specifications

Power Requirements	
AC input voltage	100 to 240 VAC (autoranging) 1.3 to 0.8 A, 50 to 60 Hz
Power consumption	<ul style="list-style-type: none"> 30 W, 103 BTUs per hour (Catalyst 2960-24-S, 2960-Plus 24TC-S, and 2960-24TC-S) 45 W, 154 BTUs per hour (Catalyst 2960-Plus 48TC-S and 2960-48TC-S)
Power rating	<ul style="list-style-type: none"> 0.05 KVA (Catalyst 2960-24-S, 2960-Plus 24TC-S, and 2960-24TC-S) 0.075 KVA (Catalyst 2960-Plus 48TC-S and 2960-48TC-S)
Physical Dimensions	
Weight	8 lb (3.63 kg)
Dimensions (H x D x W)	1.73 x 9.3 x 17.5 in. (4.39 x 23.62 x 44.45 cm)

Table A-3 Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-24LT-L, 2960-Plus 48PST-L, and 2960-48PST-L Switch Specifications

Power Requirements	
AC input voltage	100 to 240 VAC (autoranging) 8 to 4 A, 50 to 60 Hz (Catalyst 2960-Plus 24PC-L and 2960-24PC-L) 3 to 1.5 A, 50 to 60 Hz (Catalyst 2960-24LT-L) 5 to 2 A, 50 to 60 Hz (Catalyst 2960-Plus 48PST-L and 2960-48PST-L)
DC input voltage for RPS 2300	+12 V $\overline{\text{---}}$ @ 11.25 A, -48 V $\overline{\text{---}}$ @ 7.8 A (Catalyst 2960-Plus 24PC-L and 2960-24PC-L) +12 V $\overline{\text{---}}$ @ 8.3 A, -48 V $\overline{\text{---}}$ @ 2.7A (Catalyst 2960-24LT-L) +12 V $\overline{\text{---}}$ @ 4 A, -48 V $\overline{\text{---}}$ @ 7.8A (Catalyst 2960-Plus 48PST-L and 2960-48PST-L)
Power consumption ¹	100 W, 341 BTUs per hour (Catalyst 2960-Plus 24PC-L and 2960-24PC-L) 51 W, 174 BTUs per hour (Catalyst 2960-24LT-L) 483 W, 1647 BTUs per hour (Catalyst 2960-Plus 48PST-L and 2960-48PST-L)
Power rating	0.470 KVA (Catalyst 2960-Plus 24PC-L and 2960-24PC-L) 0.175 KVA (Catalyst 2960-24LT-L) 0.5 KVA (Catalyst 2960-Plus 48PST-L and 2960-48PST-L)
Power over Ethernet	
15.4 W-per-port maximum, 370-W switch maximum (Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-Plus 48PST-L and Catalyst 2960-48PST-L)	
15.4-W-per-port maximum, 124-W switch maximum (Catalyst 2960-24LT-L)	

Table A-3 Catalyst 2960-Plus 24PC-L, 2960-24PC-L, 2960-24LT-L, 2960-Plus 48PST-L, and 2960-48PST-L Switch Specifications (continued)

Physical Dimensions	
Weight	12 lb (5.44 kg) (Catalyst 2960-Plus 24PC-L and 2960-24PC-L) 10 lb (4.54 kg) (Catalyst 2960-24LT-L) 12 lb (5.44 kg) (Catalyst 2960-Plus 48PST-L and 2960-48PST-L)
Dimensions (H x D x W)	1.73 x 13 x 17.5 in. (4.39 x 33.02 x 44.45 cm) (Catalyst 2960-Plus 24PC-L, 2960-24PC-L and 2960-24LT-L) 1.73 x 12.9 x 17.5 in. (4.39 x 32.77 x 44.45 cm) (Catalyst 2960-Plus 48PST-L and 2960-48PST-L)

1. The power consumption values are for the switch input power.

Table A-4 Catalyst 2960-Plus 24TC-L, 2960-24TC-L and 2960-24TT-L Switch Specifications

Power Requirements	
AC input voltage	100 to 240 VAC (autoranging) 1.3 to 0.8 A, 50 to 60 Hz
DC input voltage for RPS 2300	+12 V $\overline{\text{---}}$ @5 A
DC input voltage for RPS 675	+12 V $\overline{\text{---}}$ @5 A
Power consumption	30 W, 103 BTUs per hour
Power rating	0.05 KVA
Physical Dimensions	
Weight	8 lb (3.63 kg)
Dimensions (H x D x W)	1.73 x 9.3 x 17.5 in. (4.39 x 23.62 x 44.45 cm)

Table A-5 Catalyst 2960-Plus 48TC-L, 2960-48TC-L, 2960-48TT-S, and 2960-48TT-L Switch Specifications

Power Requirements	
AC input voltage	100 to 240 VAC (autoranging) 1.3 to 0.8 A, 50 to 60 Hz
DC input voltage for RPS 2300	+12 V $\overline{\text{---}}$ @5 A
DC input voltage for RPS 675	+12 V $\overline{\text{---}}$ @5 A
Power consumption	45 W, 154 BTUs per hour
Power rating	0.075 KVA
Physical Dimensions	
Weight	8 lb (3.63 kg)
Dimensions (H x D x W)	1.73 x 9.3 x 17.5 in. (4.39 x 23.62 x 44.45 cm)

Table A-6 Catalyst 2960G-24TC-L and Catalyst 2960G-48TC-L Switch Specifications

Power Requirements	
AC input voltage	100 to 240 VAC (autoranging) 3 to 1.5 A, 50 to 60 Hz
DC input voltage for RPS 2300	+12 V $\overline{\text{---}}$ @10.5 A
DC input voltage for RPS 675	+12 V $\overline{\text{---}}$ 10.5 A
Power consumption	75 W, 256 BTUs per hour (Catalyst 2960G-24TC-L) 140 W, 477 BTUs per hour (Catalyst 2960G-48TC-L)
Power rating	0.075 KVA (Catalyst 2960G-24TC-L) 0.14 KVA (Catalyst 2960G-48TC-L)
Physical Dimensions	
Weight	10 lb (4.54 kg) (Catalyst 2960G-24T-L) 12 lb (5.44 kg) (Catalyst 2960G-48TC-L)
Dimensions (H x D x W)	1.73 x 12.9 x 17.5 in. (4.39 x 32.76 x 44.45 cm)

Table A-7 Catalyst 2960-8TC-L, 2960G-8TC-L, 2960-8TC-S, and 2960PD-8TT-L Switch Specifications

Power Requirements	
AC input voltage	100 to 240 VAC (autoranging) 0.5 to 0.25 A, 50 to 60 Hz (Catalyst 2960-8TC-L and Catalyst 2960-8TC-S) 0.8 to 0.4 A, 50 to 60 Hz (Catalyst 2960G-8TC-L) Unspecified when AC power adapter installed (Catalyst 2960PD-8TT-L)
DC input voltage	48 VDC, 0.3 A (Catalyst 2960PD-8TT-L)
Power consumption	20 W, 68 BTUs per hour (Catalyst 2960-8TC-L and Catalyst 2960-8TC-S) 30 W, 102 BTUs per hour (Catalyst 2960G-8TC-L) 11 W, 38 BTUs per hour (Catalyst 2960PD-8TT-L ¹)
Power rating	0.035 KVA (Catalyst 2960-8TC-L, Catalyst 2960-8TC-S, and Catalyst 2960PD-8TT-L) 0.05 KVA (Catalyst 2960G-8TC-L) 11 W (Catalyst 2960PD-8TT-L)
Physical Dimensions	
Weight	3 lb (1.4 kg)
Dimensions (H x D x W)	1.73 x 6.4 x 10.6 in. (4.4 x 16.3 x 26.9 cm) (Catalyst 2960-8TC-L, 2960-8TC-S, and Catalyst 2960PD-8TT-L) 1.73 x 8.1 x 10.6 in. (4.4 x 20.5 x 26.9 cm) (Catalyst 2960G-8TC-L)

1. The power consumption for the Catalyst 2960PD-8TT-L switch is for the switch system and does not refer to power consumption with the optional AC power adapter installed.

Table A-8 Catalyst 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, 2960-24PC-S, 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S Switch Specifications

Power Requirements	
AC input voltage	100 to 240 VAC (autoranging) 8 to 4 A, 50 to 60 Hz (Catalyst 2960-Plus 24PC-S and 2960-24PC-S) 3 to 1.5 A, 50 to 60 Hz (Catalyst 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S) 5 to 2 A, 50 to 60 Hz (Catalyst 2960-Plus 48PST-S and 2960-48PST-S)
DC input voltage for RPS 2300	+ 12 V $\overline{\text{---}}$ @ 11.25 A, $\overline{\text{---}}$ 48 V $\overline{\text{---}}$ @ 7.8 A (Catalyst 2960-Plus 24PC-S and 2960-24PC-S) + 12 V $\overline{\text{---}}$ @ 8.3 A, $\overline{\text{---}}$ 48 V $\overline{\text{---}}$ @ 2.7 A (Catalyst 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S) +12 V $\overline{\text{---}}$ @ 4 A, $\overline{\text{---}}$ 48 V $\overline{\text{---}}$ @ 7.8 A (Catalyst 2960-Plus 48PST-S and 2960-48PST-S)
Power consumption ¹	100 W, 341 BTUs per hour (Catalyst 2960-Plus 24PC-S and 2960-24PC-S) 51 W, 174 BTUs per hour (Catalyst 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S) 483 W, 1647 BTUs per hour (Catalyst 2960-Plus 48PST-S and 2960-48PST-S)
Power rating	0.470 KVA (Catalyst 2960-Plus 24PC-S and 2960-24PC-S) 0.175 KVA (Catalyst 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S) 0.5 KVA (Catalyst 2960-Plus 48PST-S and 2960-48PST-S)
Power over Ethernet	
15.4 W-per-port maximum, 370-W switch maximum (Catalyst 2960-Plus 48PST-S, 2960-48PST-S, 2960-Plus 24PC-S, 2960-24PC-S switches).	
15.4 W-per-port maximum, 124-W switch maximum (Catalyst 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S).	
Physical Dimensions	
Weight	12 lb (5.44 kg) (Catalyst 2960-Plus 24PC-S and 2960-24PC-S) 10 lb (4.54 kg) (Catalyst 2960-Plus 24LC-L, 2960-Plus 24LC-S and 2960-24LC-S) 12 lb (5.44 kg) (Catalyst 2960-Plus 48PST-S and 2960-48PST-S)
Dimensions (H x W x D)	1.73 x 13 x 17.5 in. (4.39 x 33.02 x 44.45 cm)

1. The power consumption values are for the switch input power.



APPENDIX **B**

Connector and Cable Specifications

This appendix describes the Catalyst 2960 switch ports and the cables and adapters that you use to connect the switch to other devices and includes these sections:

- [Connector Specifications, page B-1](#)
- [Cable and Adapter Specifications, page B-4](#)

Connector Specifications

These sections describe the connectors used with the Catalyst 2960 switch:

- [10/100/1000 Ports, page B-1](#)
- [SFP Module Ports, page B-3](#)
- [Dual-Purpose Ports, page B-3](#)
- [Console Port, page B-4](#)

10/100/1000 Ports

The 10/100/1000 Ethernet ports on the Catalyst 2960 switch use standard RJ-45 connectors. [Figure B-1](#) shows the pinout.



Note

The auto-MDIX feature is enabled by default. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

Connecting to 10BASE-T- and 100BASE-TX-Compatible Devices

When connecting the ports to 10BASE-T- and 100BASE-TX-compatible devices, such as servers, workstations, and routers, you can use a two or four twisted-pair, straight-through cable wired for 10BASE-T and 100BASE-TX. [Figure B-5](#) shows the two twisted-pair, straight-through cable schematics. [Figure B-7](#) shows the four twisted-pair, straight-through cable schematics.

When connecting the ports to 10BASE-T- and 100BASE-TX-compatible devices, such as switches or repeaters, you can use a two or four twisted-pair, crossover cable. [Figure B-6](#) shows the two twisted-pair, crossover cable schematics. [Figure B-8](#) shows the four twisted-pair, crossover cable schematics.

You can use Category 3, 4, or 5 cabling when connecting to 10BASE-T-compatible devices. You must use Category 5 cabling when connecting to 100BASE-TX-compatible devices.

Connecting to 1000BASE-T Devices

When connecting the ports to 1000BASE-T devices, such as servers, workstations, and routers, you must use a four twisted-pair, Category 5, straight-through cable wired for 10BASE-T, 100BASE-TX, and 1000BASE-T. [Figure B-7](#) shows the straight-through cable schematics.

When connecting the ports to other devices, such as switches or repeaters, you must use a four twisted-pair, Category 5 or higher crossover cable. [Figure B-8](#) shows the crossover cable schematics.



Note

Be sure to use a four twisted-pair, Category 5 cable when connecting to a 1000BASE-T-compatible device.



Note

Use a straight-through cable to connect two ports only when one port is designated with an X. Use a crossover cable to connect two ports when both ports are designated with an X or when both ports do not have an X.

Figure B-1 10/100/1000 Port Pinouts

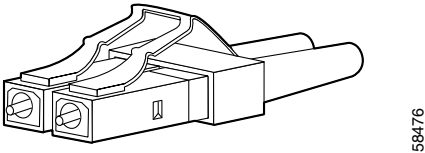
Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

60915

SFP Module Ports

The Catalyst 2960 switch uses SFP modules for fiber-optic and copper uplink ports. See the Catalyst 2960 switch release notes for a list of supported SFP modules.

Figure B-2 Fiber-Optic SFP Module LC Connector



Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Figure B-3 Copper SFP Module RJ-45 Connector

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	A line drawing of a Copper SFP Module RJ-45 Connector. It shows a rectangular body with eight pins on the top edge. A small label '60915' is positioned to the right of the connector.
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

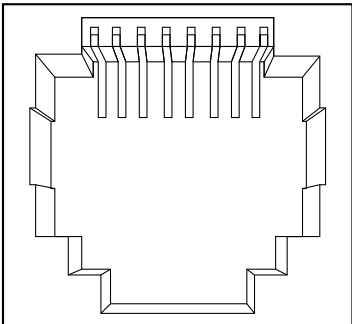
Dual-Purpose Ports

The Ethernet port on a dual-purpose port uses standard RJ-45 connectors. [Figure B-4](#) shows the pinouts. The SFP module slot on a dual-purpose port uses SFP modules for fiber-optic and copper uplink ports. See the Catalyst 2960 switch release notes for a list of supported SFP modules.



The auto-MDIX feature is enabled by default. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

Figure B-4 10/100/1000 Port Pinouts

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	

Console Port

The console port uses an 8-pin RJ-45 connector, which is described in [Table B-2](#) and [Table B-3](#). The supplied RJ-45-to-DB-9 adapter cable is used to connect the console port of the switch to a console PC. You need to provide a RJ-45-to-DB-25 female DTE adapter if you want to connect the switch console port to a terminal. You can order a kit (part number ACS-DSBUASYN=) containing that adapter from Cisco. For console port and adapter pinout information, see [Table B-2](#) and [Table B-3](#).

Cable and Adapter Specifications

These sections describe the cables and adapters used with Catalyst 2960 switches:

- [SFP Module Cable Specifications, page B-4](#)
- [Two Twisted-Pair Cable Pinouts, page B-6](#)
- [Four Twisted-Pair Cable Pinouts for 1000BASE-T Ports, page B-6](#)
- [Crossover Cable and Adapter Pinouts, page B-7](#)

SFP Module Cable Specifications

[Table B-1](#) lists the cable specifications for the fiber-optic SFP module connections. Each port must match the wave-length specifications on the other end of the cable, and for reliable communications, the cable must not exceed the required cable length. Copper 1000BASE-T SFP transceivers use standard four twisted-pair, Category 5 or greater cable at lengths up to 328 feet (100 meters).

Table B-1 *Fiber-Optic SFP Module Port Cabling Specifications*

SFP Module	Wavelength (nanometers)	Fiber Type	Core Size/Cladding Size (micron)	Modal Bandwidth (MHz/km) ¹	Cable Distance
100BASE-BX (GLC-FE-100BX-D GLC-FE-100BX-U)	1310 TX 1550 RX	SMF	G.652 ²	—	32,810 feet (10 km)
100BASE-FX (GLC-GE-100FX)	1310	MMF	50/125 62.5/125	500 500	6,562 feet (2 km) 6,562 feet (2 km)
100BASE-FX (GLC-FE-100FX)	1310	MMF	50/125 62.5/125	500 500	6,562 feet (2 km) 6,562 feet (2 km)
100BASE-LX (100BASE-LX10)	1310	SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-BX10-D (GLC-BX-D)	1490 TX 1310 RX	SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-BX10-U (GLC-BX-U)	1310 TX 1490 RX	SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-SX (GLC-SX-MM)	850	MMF	62.5/125 62.5/125 50/125 50/125	160 200 400 500	722 feet (220 m) 902 feet (275 m) 1640 feet (500 m) 1804 feet (550 m)
1000BASE-LX/LH (GLC-LH-SM)	1310	MMF ³	62.5/125 50/125 50/125	500 400 500	1804 feet (550 m) 1804 feet (550 m) 1804 feet (550 m)
		SMF	G.652 ²	—	32,810 feet (10 km)
1000BASE-ZX (GLC-ZX-SM)	1550	SMF	G.652 ²	—	43.4 to 62 miles (70 to 100 km) ⁴
CWDM	1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610	SMF	G.652 ²	—	62 miles (100 km)

1. Modal bandwidth applies only to multimode fiber.
2. A mode-field diameter/cladding diameter = 9 micrometers/125 micrometers
3. A mode-conditioning patch cord is required. Using an ordinary patch cord with MMF, 1000BASE-LX/LH SFP modules, and a short link distance can cause transceiver saturation, resulting in an elevated bit error rate (BER). When using the LX/LH SFP module with 62.5-micron diameter MMF, you must also install a mode-conditioning patch cord between the SFP module and the MMF cable on both the sending and receiving ends of the link. The mode-conditioning patch cord is required for link distances greater than 984 feet (300 m).
4. 1000BASE-ZX SFP modules can send data up to 62 miles (100 km) by using dispersion-shifted SMF or low-attenuation SMF; the distance depends on the fiber quality, the number of splices, and the connectors.

Two Twisted-Pair Cable Pinouts

Figure B-5 and Figure B-6 show the schematics of two twisted-pair cables for connecting to 10BASE-T- and 100BASE-TX-compatible devices.

Figure B-5 Two Twisted-Pair Straight-Through Cable Schematic

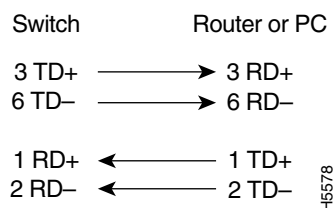
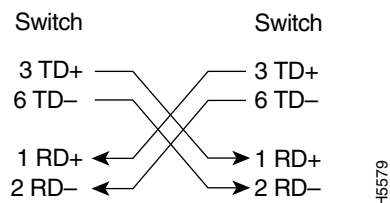


Figure B-6 Two Twisted-Pair Crossover Cable Schematic



Four Twisted-Pair Cable Pinouts for 1000BASE-T Ports

Figure B-7 and Figure B-8 show the schematics of four twisted-pair cables for 10/100/1000 ports on Catalyst 2960 switches.

Figure B-7 Four Twisted-Pair Straight-Through Cable Schematic for 10/100/1000 Ports

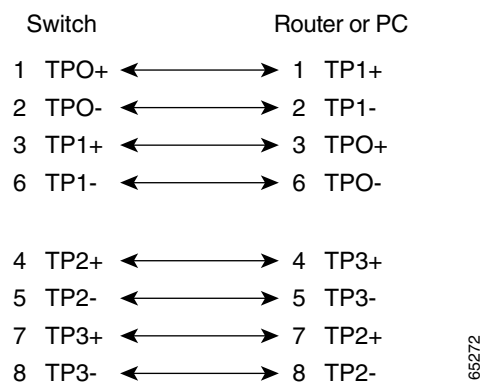
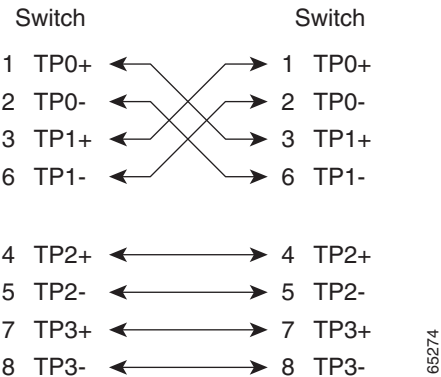


Figure B-8 Four Twisted-Pair Crossover Cable Schematics for 10/100/1000 Ports



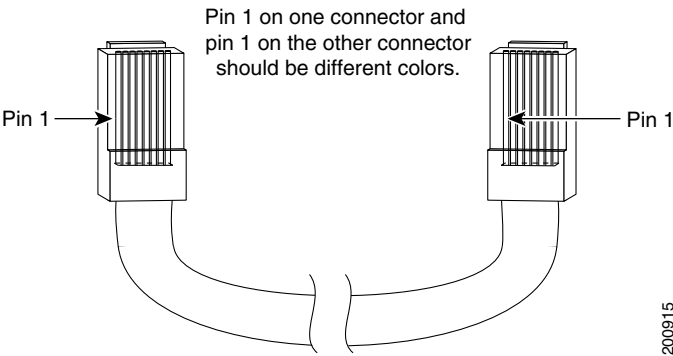
Crossover Cable and Adapter Pinouts

This section describes how to identify a crossover cable and also describes the adapter pinouts.

Identifying a Crossover Cable

To identify a crossover cable, compare the two modular ends of the cable. Hold the cable ends side-by-side, with the tab at the back. The wire connected to the pin on the outside of the left plug should be a different color from the wire connected to the pin on the inside of the right plug. (See [Figure B-9](#).)

Figure B-9 Identifying a Crossover Cable



Adapter Pinouts

Table B-2 lists the pinouts for the console port, the RJ-45-to-DB-9 adapter cable, and the console device.

Table B-2 Console Port Signaling Using a DB-9 Adapter

Switch Console Port (DTE)	RJ-45-to-DB-9 Terminal Adapter	Console Device
Signal	DB-9 Pin	Signal
RTS	8	CTS
DTR	6	DSR
TxD	2	RxD
GND	5	GND
GND	5	GND
RxD	3	TxD
DSR	4	DTR
CTS	7	RTS

Table B-3 lists the pinouts for the console port, RJ-45-to-DB-25 female DTE adapter, and the console device.



Note

The RJ-45-to-DB-25 female DTE adapter is not supplied with the switch. You can order a kit (part number ACS-DSBUASYN=) containing this adapter from Cisco.

Table B-3 Console Port Signaling Using a DB-25 Adapter

Switch Console Port (DTE)	RJ-45-to-DB-25 Terminal Adapter	Console Device
Signal	DB-25 Pin	Signal
RTS	5	CTS
DTR	6	DSR
TxD	3	RxD
GND	7	GND
GND	7	GND
RxD	2	TxD
DSR	20	DTR
CTS	4	RTS



APPENDIX **C**

Configuring the Switch with the CLI-Based Setup Program

This appendix provides a command-line interface (CLI)-based setup procedure for a standalone switch. For product overview information, see [Chapter 1, “Product Overview.”](#)

Before you connect the switch to a power source, review the safety warnings in [Chapter 2, “Switch Installation \(24- and 48-Port Switches\),”](#) and [Chapter 3, “Switch Installation \(8-Port Switches\).”](#)

For installation procedures for mounting your switch, connecting to the switch ports, or connecting to the small form-factor pluggable (SFP) modules, see [Chapter 2, “Switch Installation \(24- and 48-Port Switches\),”](#) and [Chapter 3, “Switch Installation \(8-Port Switches\).”](#)

These steps describe how to do an installation:

1. [Accessing the CLI, page C-1](#)
2. [Connecting to the Console Port, page C-3](#)
3. [Starting the Terminal Emulation Software, page C-3](#)
4. [Connecting to a Power Source, page C-4](#)
5. [Entering the Initial Configuration Information, page C-4](#)

Accessing the CLI

For an unconfigured switch, you can access the CLI through Express Setup or through the console port.

Accessing the CLI Through Express Setup

You can access the CLI on an unconfigured switch by placing the switch in Express Setup mode and then connecting an Ethernet port of the switch to the Ethernet port of your PC or workstation. To put the switch into Express Setup mode, follow the steps described in the *Catalyst 2960 Switch Getting Started Guide* for powering on the switch and using Express Setup.

After the switch is in Express Setup mode, open a Telnet session to the switch by using the IP address **10.0.0.1**. Enter the setup user EXEC command. See these sections in this chapter to configure the switch by using the CLI:

- [Entering the Initial Configuration Information, page C-4](#)
- [Completing the Setup Program, page C-5](#)

After you have entered the configuration information for the switch, save it to flash memory by using the **write memory** privileged EXEC command.

**Note**

While in Express Setup mode, the IP address **10.0.0.1** remains active on the switch until you enter the **write memory** command. You lose the Telnet connection after entering the **write memory** command.

For more information about using the CLI, refer to the command reference for this release.

Accessing the CLI Through the Console Port

You can access the CLI on a configured or unconfigured switch by connecting the console port of the switch to the serial port on your PC or workstation and accessing the switch through a Telnet session.

To access the switch through the console port, follow these steps:

- [Connecting to the Console Port, page C-3](#)
- [Starting the Terminal Emulation Software, page C-3](#)
- [Connecting to a Power Source, page C-4](#)
- [Entering the Initial Configuration Information, page C-4](#)

See the switch getting started guide for a list of what ships with your switch.

**Note**

You need to provide the Category 5 or higher straight-through cables to connect the switch ports to other Ethernet devices.

**Note**

The auto-MDIX feature is enabled by default. For configuration information for this feature, see the switch software configuration guide or the switch command reference.

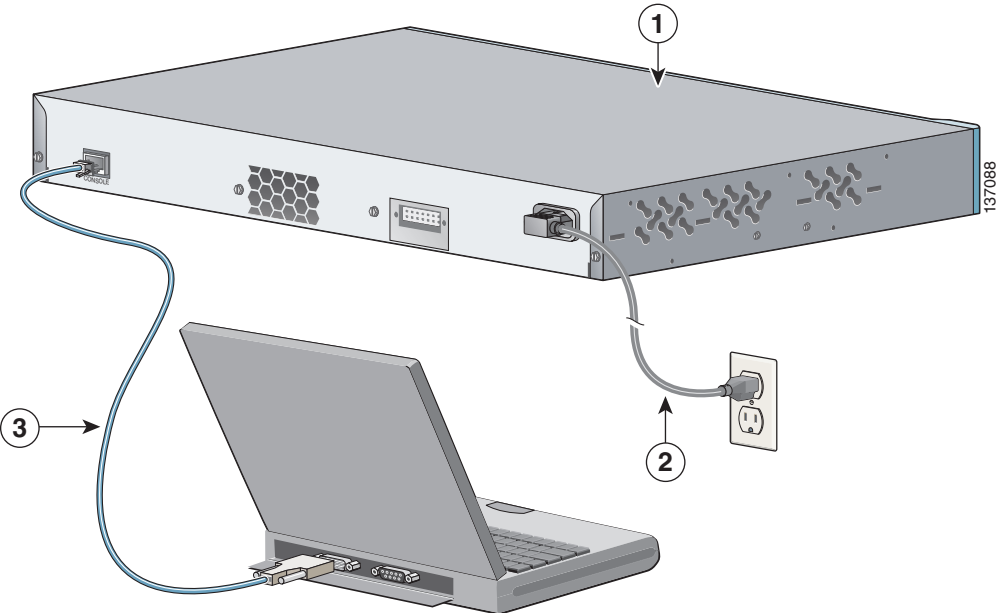
Connecting to the Console Port

You can use the console port to perform the initial configuration. To connect the switch console port to a PC, use the supplied RJ-45-to-DB-9 adapter cable.

Follow these steps to connect the PC or terminal to the switch:

- Step 1** Using the supplied RJ-45-to-DB-9 adapter cable, insert the RJ-45 connector into the console port on the rear of a switch, as shown in [Figure C-1](#).

Figure C-1 Connecting a Switch to a PC



1	Catalyst 2960 switch	3	RJ-45-to-DB-9 adapter cable
2	Power cord		

- Step 2** Attach the DB-9 female DTE of the adapter cable to a PC serial port, or attach an appropriate adapter to the terminal.

Starting the Terminal Emulation Software

Before you power on the switch, start the terminal emulation session so that you can see the output display from the power-on self-test (POST). The terminal-emulation software—frequently a PC application such as Hyperterminal or Procomm Plus—makes communication between the switch and your PC or terminal possible.

- Step 1** Start the terminal-emulation program and open a session if you are using a PC or terminal.
- Step 2** Start a terminal-emulation session.

- Step 3** Configure the baud rate and character format of the PC or terminal to match these console port default characteristics:
- 9600 baud
 - 8 data bits
 - 2 stop bits
 - No parity
 - None (flow control)
-

Connecting to a Power Source

Follow these steps to connect to a power source:

- Step 1** Connect one end of the supplied AC power cord to the power connector on a switch rear panel. See [Figure C-1](#).
- Step 2** Connect the other end of the power cable to a grounded AC outlet.



Note If you are connecting the switch to a Cisco redundant power system (RPS), refer to the documentation that shipped with your RPS.

As the switch powers on, it begins the power-on self test (POST), a series of tests that runs automatically to ensure that the switch functions properly. POST lasts approximately 1 minute. When the switch begins POST, the System, RPS, Status, Duplex, and Speed LEDs turn green. The System LED blinks green, and the other LEDs remain solid green.

When the POST completes successfully, the System LED remains green. The RPS LED remains green for some time and then reflects the switch operating status. The other LEDs turn off and then reflect the switch operating status. If a switch fails POST, the System LED turns amber.

POST failures are usually fatal. Call Cisco technical support representative if your switch fails POST.

If you started the terminal emulation program before you powered on your switch, the PC or terminal displays the bootloader sequence. You need to press **Enter** to display the setup program prompt.

Entering the Initial Configuration Information

To set up the switch, you need to complete the setup program, which runs automatically after the switch is powered up. You must assign an IP address and other configuration information necessary for the switch to communicate with the local routers and the Internet. This information is also required if you plan to use the Network Assistant to configure and manage the switch.

IP Settings

You need this information from your network administrator before you complete the setup program:

- Switch IP address
- Subnet mask (IP netmask)
- Default gateway (router)
- Enable secret password
- Enable password
- Telnet password

Completing the Setup Program

Follow these steps to complete the setup program and to create an initial configuration for the switch:

Step 1 Enter **Yes** at these two prompts.

```
Would you like to enter the initial configuration dialog? [yes/no]: yes
```

```
At any point you may enter a question mark '?' for help.  
Use ctrl-c to abort configuration dialog at any prompt.  
Default settings are in square brackets '[]'.
```

```
Basic management setup configures only enough connectivity  
for management of the system, extended setup will ask you  
to configure each interface on the system.
```

```
Would you like to enter basic management setup? [yes/no]: yes
```

Step 2 Enter a host name for the switch, and press **Return**.

On a command switch, the host name is limited to 28 characters; on a member switch to 31 characters. Do not use *-n*, where *n* is a number, as the last character in a host name for any switch.

```
Enter host name [Switch]: host_name
```

Step 3 Enter an enable secret password, and press **Return**.

The password can be from 1 to 25 alphanumeric characters, can start with a number, is case sensitive, allows spaces, but ignores leading spaces. The secret password is encrypted and the enable password is in plain text.

```
Enter enable secret: secret_password
```

Step 4 Enter an enable password, and press **Return**.

```
Enter enable password: enable_password
```

Step 5 Enter a virtual terminal (Telnet) password, and press **Return**.

The password can be from 1 to 25 alphanumeric characters, is case sensitive, allows spaces, but ignores leading spaces.

```
Enter virtual terminal password: terminal-password
```

- Step 6** (Optional) Configure Simple Network Management Protocol (SNMP) by responding to the prompts. You can also configure SNMP later through the CLI, the device manager, or the Network Assistant application. To configure SNMP later, enter **no**.

Configure SNMP Network Management? [no]: **no**

- Step 7** Enter the interface name (physical interface or VLAN name) of the interface that connects to the management network, and press **Return**. For this release, always use **vlan1** as that interface.

Enter interface name used to connect to the management network from the above interface summary: **vlan1**

- Step 8** Configure the interface by entering the switch IP address and subnet mask and pressing **Return**. The IP address and subnet masks shown below are examples.

```
Configuring interface vlan1:
Configure IP on this interface? [yes]: yes
IP address for this interface: 10.4.120.106
Subnet mask for this interface [255.0.0.0]: 255.0.0.0
```

- Step 9** Enter **Y** to configure the switch as the cluster command switch. Enter **N** to configure it as a member switch or as a standalone switch.

If you enter **N**, the switch appears as a candidate switch in the Network Assistant GUI. You can configure the switch as a command switch later through the CLI, the device manager, or the Network Assistant application. To configure it later, enter **no**.

Would you like to enable as a cluster command switch? [yes/no]: **no**

You have now completed the initial configuration of the switch, and the switch displays its initial configuration. This is an example of output that appears:

```
The following configuration command script was created:
hostname switch1
enable secret 5 $1$U1q8$D1A/OiaEb190WcBPd9cOn1
enable password enable_password
line vty 0 15
password terminal-password
no snmp-server
!
no ip routing

!
interface Vlan1
no shutdown
ip address 10.4.120.106 255.0.0.0
!
interface FastEthernet0/1
!
interface FastEthernet0/2

interface FastEthernet0/3
!
...<output abbreviated>
!
interface GigabitEthernet0/28
!
end
```

- Step 10** These choices appear:

[0] Go to the IOS command prompt without saving this config.

[1] Return back to the setup without saving this config.

[2] Save this configuration to nvram and exit.

If you want to save the configuration and use it the next time the switch reboots, save it in NVRAM by selecting option 2.

Enter your selection [2]:**2**

Make your selection, and press **Return**.

After you complete the setup program, the switch can run the default configuration that you created. If you want to change this configuration or want to perform other management tasks, use one of these tools:

- Command-line interface (CLI)
- Network Assistant (for one or more switches)

To use the CLI, enter commands at the *Switch>* prompt through the console port by using a terminal emulation program or through the network by using Telnet. For configuration information, see the switch software configuration guide or the switch command reference.

To use the Network Assistant, see the *Getting Started with Cisco Network Assistant* guide on Cisco.com.

